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FIRST-AID TO WOUNDED ANCIENT ROMAN SOLDIERS.—Trajan's army has just encountered and defeated a detachment of Dacians who attempted to bar its passage across the mountains. The wounded are receiving attention. Supported by a comrade, a legionary soldier is seated upon a rock having his left arm examined by the doctor. A surgeon binds the wounded leg of an auxiliary who leans upon him with his right hand. There was no organised army medical service among the Romans before the Empire. Wounded soldiers could seldom obtain treatment. We learn from the ancient historians that under the Republic the highest officers took their private physicians with them on campaign. Early in the Empire, however, a regular medical service was instituted. Each division had at least one *medicus* and the sick were cared for in hospitals and tents. There was one hospital, *valetudinarium*, to three legions; the officer in charge had male nurses under him. The standing of the *medicus* was that of an inferior officer. Very exceptionally he appears to have received double pay. Date: A.D. 102-107.

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THE ETIOLOGY OF INFLUENZA.

A FILTRABLE VIRUS AS THE CAUSE, WITH SOME NOTES ON THE CULTURE OF THE VIRUS BY NOGUCHI'S METHOD.

BY

(THE LATE) MAJOR H. GRAEME GIBSON, R.A.M.C.,

MAJOR F. B. BOWMAN, C.A.M.C.,

AND

CAPTAIN J. I. CONNOR, A.A.M.C.

(Report to the Medical Research Committee.)

SINCE the results of our preliminary experiments were reported in the BRITISH MEDICAL JOURNAL of December 14th, 1918,[1] in an article entitled "A Filtrable Virus as the Cause of the Early Stage of the Present Epidemic of Influenza," further work has been carried out which confirms that already reported. We have also attempted to cultivate the "filtrable virus" of influenza and have made experiments in the transmission of the disease to animals by inoculation with the cultures so obtained. These cultural experiments were suggested by one of us (H. G. G.) at an early stage of the work, and later, a paper by G. Foster,[2] to which we had access, clearly showed that this part of the work might prove to be a very important part of the investigation.

A full report of the work with which this article deals, with complete data and plates, will appear later. The present report is merely a summary of the work done to date and is framed in as concentrated a form as possible. It is forwarded at this time in order that other workers who may be engaged in the investigation of influenza may have the opportunity of knowing on what lines we have been working and the results that we have obtained.

The animals used by us for experimental purposes have been baboons, *Macacus rhesus* monkeys, rabbits, guinea-pigs, and mice. By the inoculation of sputum, both filtered and unfiltered, from cases of influenza, we have succeeded in producing, in all these animals, lesions that appear similar to those seen in human cases of the disease.

For experiments with blood transmission we used *M. rhesus* monkeys and mice. Although the results obtained in the only two cases in which monkeys were inoculated with blood were not wholly satisfactory, the experiments with mice gave a high percentage of positive results, and it seems to be possible to transmit the virus by means of infected blood to the latter animals. It should be noted that the mice received a very much larger dose per body weight than the monkeys, and this factor, no doubt, played a part in the results obtained.

With cultures it was found to be possible to infect monkeys, rabbits, guinea-pigs, and mice. Owing to the grave nature of the influenza epidemic in progress, it was not thought advisable to attempt any experiments in the transmission of the disease to human volunteers, both on account of the danger involved and owing to the fact that there would have been no guarantee, in the face of so widely spread an epidemic, that the individual to be experimented upon had not already been exposed to infection.

A general description of the clinical symptoms and the pathological lesions found *post mortem* is not included and will appear in a later report to the Medical Research Committee, as will also certain details regarding the preparation of material for inoculation.

ANIMAL INOCULATION AND CULTURAL EXPERIMENTS WITH FILTRABLE VIRUS.

The work may be divided into four parts:

I. Inoculation of animals with sputum from cases of influenza.
II. Inoculation of animals with blood from cases of influenza.
III. Passage of the virus from animal to animal.
IV. Cultural experiments and inoculation of cultures into animals.

I. INOCULATION OF ANIMALS WITH SPUTUM FROM CASES OF INFLUENZA.

Source of Infected Material.

The sputum used was as a rule collected as early as possible in the disease. As uncomplicated cases of influenza as a rule present a pyrexial period of only a few days' duration, we considered that it would be during those few days that we should have the greatest chance of recovering the virus. As a rule, a certain amount of sputum was obtainable on the second or third day, and this, generally speaking, was frothy, of a greyish-yellow colour, tenacious, often markedly blood-stained, and did not present the nummular appearance seen in cases of bronchitis.

Method of Inoculation and Size of Dose Given.

Emulsions of unfiltered and filtered sputum were inoculated by the same routes and the size of the dose was the same in each case. When dealing with monkeys the method of administration of unfiltered sputum reported by Nicolle and Lebailly was followed. This consisted in injecting 0.25 c.cm. of the emulsion under the conjunctiva of each eye and instilling 0.5 c.cm. of the emulsion up the animal's nose. In one instance we inoculated one monkey by the conjunctival route alone, and gave another monkey 0.5 c.cm. of the same filtrate up its nostrils alone. The former gave a positive result, while the latter proved negative. Rabbits were given 1.2 c.cm. of the filtered sputum either intravenously or subcutaneously; positive results were obtained by both methods. Guinea-pigs and mice were always inoculated subcutaneously whether unfiltered or filtered sputum was used. Guinea-pigs were usually given 1 c.cm., and mice, when used, received 0.25 c.cm. of the unfiltered or filtered sputum.

Results.

In dealing with the results obtained it is convenient to separate the various animals employed into different groups.

Monkeys.—We may divide these into two main groups according to whether the sputum used as the infecting agent was taken from the patient during the first three days of the disease or at a later date. The results are shown in the subjoined table:

GROUP I.—*Sputum Collected Early.*

Type of Monkey.	Material Used for Inoculation.	Day of Disease on which Sputum was Taken.	Result.
1. M. rhesus ...	Unfiltered sputum	Third	Positive
2. M. rhesus ...	Unfiltered sputum	Third	Doubtful
3. M. rhesus ...	Filtered sputum	Third	Positive
4. M. rhesus ...	Filtered sputum	Third	Positive
5. M. rhesus ...	Filtered sputum	Second-third	Positive
6. M. rhesus ...	Filtered sputum	Third	Positive
7. M. rhesus ...	Filtered sputum	Third	Negative

This gives 80 per cent. positive results among the *M. rhesus* monkeys inoculated with *filtered* sputum taken from cases of influenza before the end of the third day of the disease. Out of the two monkeys inoculated with *unfiltered* sputum taken during the same period, one positive result was obtained, and in the other instance, although the macroscopic examination revealed little, the microscope showed patches of acute inflammation with the typical inflammatory exudate. Thus 85.7 per cent. of all monkeys inoculated with sputum, filtered or otherwise, gave positive results, if the doubtful case is included; if excluded, 71.4 per cent. were positive. Where sputum taken at a later date was inoculated the results obtained were less satisfactory. One monkey was inoculated with *unfiltered* sputum taken on the sixth day from a case of influenza. A negative result was obtained. A monkey inoculated with the *filtered* sputum from the same case also showed no signs of disease *post mortem*. A monkey inoculated with filtered sputum from a case of influenza taken on the fifth day gave a positive result.

GROUP II.—*Sputum Collected Later.*

Type of Monkey.	Material Used for Inoculation.	Day of Disease on which Sputum was Taken.	Result.
1. M. rhesus ...	Unfiltered sputum	Sixth	Negative
2. M. rhesus ...	Filtered sputum	Sixth	Negative
3. M. rhesus ...	Filtered sputum	Fifth	Positive

In this instance two out of three attempts failed, or only 33.3 per cent. were positive. These figures are very small and insufficient to justify any final opinion as to the period in which

it may be impossible to obtain the virus from a case of influenza, but with the number of monkeys which we had it was thought more profitable to concentrate our attention on sputum obtained at an earlier date. The time up to which the virus can be recovered must form the basis for further work on this subject. An attempt to infect a monkey with filtered sputum instilled up its nostrils, without any subconjunctival injection, failed, although subconjunctival injection, without nasal instillation, of the same filtrate, gave a positive result in another monkey.

Controls.—Two monkeys were inoculated with filtered sputum obtained from two cases of acute bronchitis on the third day of the disease. The sputum was prepared and filtered in the same way, and the monkeys were inoculated subconjunctivally and by nasal instillation in each case. They were given the same dose, but were both negative as regards symptoms, and the macroscopic and microscopic examination of their lungs. Another monkey died two days after arrival with a lobar pneumonia associated with M'Gowan's bacillus of distemper. The *post-mortem* findings were totally different from those seen in our experimental animals. Microscopically there was no great engorgement of capillaries, and no haemorrhagic exudate in the alveoli.

The obtaining or not of a positive result by means of the injection of monkeys with filtrable viruses depends very much more on the dose given than in the case of experimental infections with non-filtrable germs. At present it is not possible to determine the dose that is being given. It is known that while these viruses, as a rule, reproduce the picture of the human disease, as, for instance, in the case of poliomyelitis, the certainty of producing a positive result is not nearly so great as when dealing with the non-filtrable bacteria which are pathogenic for animals. In view of these facts the animal experiments with monkeys appear to us to be quite significant as far as they go.

Rabbits.—Four rabbits were inoculated. Of these, two were inoculated with filtered sputum taken on the third day from a case of influenza. One of these rabbits was given 1 c.cm. of the filtrate intravenously and the other 1 c.cm. of the filtrate subcutaneously. Both inoculations were followed by a positive result. One lung, taken from the rabbit that had been inoculated subcutaneously, was ground up in a mortar with normal saline and the extract filtered. The filtrate was inoculated into a second rabbit. (See passage experiments.) The kidney of the rabbit receiving the intravenous dose was placed in a Noguchi tube with ascites fluid. (See cultural experiments.) One rabbit was inoculated subcutaneously with 2 c.cm. of a filtrate of bronchial pus taken *post mortem* from a man who died from influenza on the twelfth day of the disease. The result was completely negative, and tends to confirm our opinion that it is likely that the virus is not recoverable after the first few days of the disease.

Control.—A rabbit was given 2 c.cm. of a filtered sputum taken on the third day of the disease in a case of acute bronchitis. Result negative.

Guinea-pigs.—Four guinea-pigs were inoculated. Two of these were inoculated with sputum taken on the night of the second day and morning of the third day from a case of influenza. One guinea-pig was given 1 c.cm. of the diluted (1 in 11) but unfiltered sputum, and the other received 1 c.cm. of the same dilution of this sputum, filtered. In each case a positive result was obtained. A guinea-pig inoculated subcutaneously with 1 c.cm. of the filtered bronchial pus mentioned above gave a negative result.

Control.—A guinea-pig inoculated subcutaneously with 1 c.cm. of the filtrate of sputum from a case of acute bronchitis also gave a negative result.

Mice.—Altogether fourteen mice were inoculated with sputum, unfiltered or filtered, from various sources. These may be divided into those inoculated with:

(*a*) Unfiltered sputum from cases of influenza.
(*b*) Filtered sputum taken during the first three days of the disease in cases of influenza.
(*c*) Heated filtered sputum taken during the first three days of the disease in cases of influenza (heated to 71° for half an hour).
(*d*) Filtered sputum taken on the sixth day of the disease and later, from influenza cases.
(*e*) Filtered sputum taken on the third day of the disease from a case of acute bronchitis.

Under Group (*a*) 3 mice were inoculated: 1 gave a negative result, 2 died of pneumococcal infection, 1 died of streptococcal infection.
Under Group (*b*) 5 mice were inoculated: 4 gave positive results, 1 was killed twenty-four hours after inoculation —result negative.
Under Group (*c*) 2 mice were inoculated: Both gave negative results. (Mice inoculated with the same filtrate unheated all died.)
Under Group (*d*) 2 mice were inoculated: Both gave negative results.
Under Group (*e*) *Control*, 1 mouse was inoculated: Result negative.

II. Inoculation of Animals with Blood from Cases of Influenza.

The following are summaries of three experiments in which animals were inoculated with blood from cases of influenza:

Experiment 1.

A case of influenza of forty-eight hours' standing was selected; 25 c.cm. of blood was drawn aseptically into a flask containing 2 c.cm. of 10 per cent. sodium citrate solution. 10 c.cm. of the whole blood was diluted with 40 c.cm. of distilled water. This laked blood was then passed through a Chamberland L 1 *bis* filter candle, under a negative pressure of 50 cm. of mercury. Both laked blood and filtrate proved to be sterile with regard to non-filtrable organisms.

Monkey No. 8 was inoculated with 5 c.cm. unfiltered whole blood subcutaneously. It was killed seven days later, and both macroscopically and microscopically gave a completely negative result.

Monkey No. 6 received 0.25 c.cm. of the filtrate subconjunctivally into each eye and 0.5 c.cm. was instilled into each nostril; five days later the animal was moping, and it was killed on the seventh day. At *post-mortem* examination the lungs appeared quite normal macroscopically, but microscopically some capillary congestion was seen with definite small patches of inflammatory change.

Three mice were inoculated. Mouse W 1 received 0.25 c.cm. of the filtrate subcutaneously. It died the same night, and the lungs were found to be markedly haemorrhagic. Mouse W 2 received 0.25 c.cm. of the filtrate subcutaneously. It was killed on the fourth day, and showed marked haemorrhages in both lungs. Mouse W 3 received 0.25 c.cm. of the filtrate, which had been heated to 55° for one hour. It died on the third day after inoculation, and also showed a marked haemorrhagic condition of the lungs. It might be noted that both mouse W 1 and mouse W 3 were infected with coccidia.

Experiment 2.

Three mice were inoculated subcutaneously with 1 c.cm. of blood from influenza cases. One mouse was inoculated with blood from a first-day case of influenza, and the lungs were typically haemorrhagic. Two of the mice were inoculated with blood from second-day cases. One was killed on the sixth day and one on the eighth day, and both were definitely positive.

As controls one mouse was inoculated with 1.25 c.cm. of normal human blood and another with 1 c.cm., and both gave entirely negative results.

Experiment 3.

This experiment was undertaken to attempt to obtain information as to the earliest time after inoculation into mice of blood from influenza cases that one may expect to find any pathological lesions in the lungs of those animals. Six mice were inoculated each with 1 c.cm. of blood taken from a case of influenza during the first twenty-four hours of the disease. These mice were each given 1 c.cm. of blood subcutaneously, and it was intended to kill these animals at varying intervals up to eight days after inoculation. However, this intention was frustrated by the fact that five out of the six mice died during the first forty-eight hours after they received the injection.

The results are best shown in tabular form:

No. of Mouse.	Inoculated.	Died.	Appearance of Lung *post mortem*.
U 1	Dec. 2, 1918	Same night	Lungs showed nothing abnormal (inoculated intraperitoneally).
U 2	,, ,,	Next morning	Both lungs showed haemorrhagic-like patches.
U 3	,, ,,	Same night	Nothing abnormal seen in lungs (inoculated intraperitonally).
U 4	,, ,,	Next morning	Left lung showed haemorrhagic-like patches.
U 5	,, ,,	Night of Dec. 3	Haemorrhagic-like patches on both lower lobes.
U 6	,, ,,	Killed Dec. 3	Lungs apparently normal.

Of the six lungs examined microscopically, two showed acute inflammatory reaction, with congestion in one instance. Of the remainder, three showed acute congestion only and one some leucocytic infiltration.

III. Passage of the Virus from Animal to Animal.

Filtered sputum from an early human case of influenza was administered to a group of two monkeys (Nos. 11 and 7), two rabbits (Nos. 1 and 2), and two mice (Nos. Z 1 and Z 2), on December 9th, 1918. Of this group, monkey No. 7 received no injection, but the filtered sputum was merely instilled into the nose. This animal remained negative. Mouse Z 2 was given an injection of *heated* filtrate, and, as was to be expected, remained negative. All the other animals were inoculated with the unheated filtrate and all gave positive results. Of these animals,

rabbit No. 2 was selected to provide material for passage experiments.

Filtered Sputum from Case.

Rabbit No. 2 +.

Rabbit No. 6 +. Guinea-pig No. 5 +.

Rabbit No. 8 +. Guinea-pig No. 8 −.

RABBIT NO. 2.

This animal was inoculated subcutaneously with 1 c.cm. of filtrate from sputum on December 9th, 1918. No symptoms of illness were noted after inoculation. It was killed and examined on December 15th.

Post-mortem Findings.

The lower lobes of both lungs showed purplish discoloration and haemorrhagic areas. Microscopically, irregular acute inflammatory changes, with early leucocytic reaction, were noted in sections of the lungs, together with engorgement of the capillaries. Bacteriological examination of the lungs was negative so far as concerns non-filtrable organisms.

The lower lobe of the left lung of this rabbit was now removed, crushed, extracted with normal saline, and the extract passed through a Chamberland F filter and used as the inoculum for further passage experiments, being injected into rabbit No. 6 and guinea-pig No. 5.

RABBIT NO. 6.

On December 15th, 1918, this rabbit was inoculated subcutaneously with 2 c.cm. of filtered lung extract from rabbit No. 2. It was killed and examined on December 23rd.

Post-mortem Findings.

Trachea.—There is found some tracheitis in the lower part of the trachea, which is filled with a frothy, blood-stained fluid, which oozes up from the bronchi.

Pleura.—Some fluid present in each pleural sac.

Lungs.—Retain shape on being placed on the table. The anterior surface of the right lung shows a patch of haemorrhage at the root of the upper lobe. The anterior surface of the left lung presents very little abnormality. The posterior surfaces of both lungs is uniformly of a dark red colour. On section, the lung substance is seen to be reddish-brown in patches, and some frothy, blood-stained fluid drips from the cut surface. Cultures on blood-agar and glucose broth were negative. Lung substance from this animal was emulsified and inoculated into rabbit No. 8 and guinea-pig No. 8.

GUINEA-PIG NO. 5.

This animal was inoculated subcutaneously, on December 15th, 1918, with 2 c.cm. of filtered lung extract from rabbit No. 2. It was killed on December 23rd. At the *post-mortem* examination both lungs were found to show large dark red patches over both anterior and posterior surfaces.

RABBIT NO. 8.

Received an intravenous injection of 2 c.cm. of lung extract from rabbit No. 6 on December 23rd, 1918, and died about one hour after inoculation.

Post-mortem Examination (December 24th).

Peritoneal cavity clear and glistening. Bowel generally pale and yellowish.

Trachea.—The upper part shows the blood vessels between rings outlined in deep red and an extreme degree of congestion seems to be present between all the cartilaginous rings. Frothy fluid wells up in the trachea from the bronchi.

Pleura.—No evidence of pleuritis on either side. No fluid present.

Lungs.—Both lungs appear much the same. Generally they are pink, with an overlying crimson and deep red coloration which looks haemorrhagic. It seems, in the gross, to be an extreme grade of what has previously been seen in infected rabbits' lungs. On section, the surface drips bloody fluid and shows numerous deep red small haemorrhagic areas on the cut surface.

Thymus.—Enlarged, soft; vessels deep red and engorged. Large numbers of deep purple haemorrhages seen on surface.

Kidneys.—Deep red. Drips blood on section. Capsule strips easily.

Liver.—Deep red. On section, blood drips from surface and lobules appear outlined in deep red.

GUINEA-PIG NO. 8.

Was inoculated subcutaneously with 2 c.cm. of lung extract from rabbit No. 6 on December 23rd, 1918. It was killed on December 31st, and at the *post-mortem* examination the lungs and other organs appeared to be normal.

REMARKS.

In the above series of experiments a tendency to increase of virulence was noted in passage through rabbits. The lesions found in rabbit No. 2 were of only moderate severity. Those produced in rabbit No. 6 by inoculation of material from rabbit No. 2 were much more severe. The inoculation of lung extract from rabbit No. 6 into rabbit No. 8 led to the rapid death of the latter, the symptoms and *post-mortem* appearances being very striking, and suggesting that the inoculum may have contained a toxin of high virulence in addition to the living virus. It should be noted that this animal received an intravenous inoculation, so that any toxin introduced would have been rapidly distributed throughout the organism. It is a remarkable thing, however, that an equivalent amount of the same lung extract proved harmless for guinea-pig No. 8, inoculated the same time as rabbit No. 8. This result may, perhaps, be explained by assuming that this guinea-pig was unusually resistant to infection. It is to be noted, too, that in this instance the injection was subcutaneous, not intravenous.

IV. CULTURAL EXPERIMENTS AND INOCULATON OF CULTURES INTO ANIMALS.

In view of apparently positive results we had obtained in the transmission of influenza to animals by means of filtered materials, blood, sputum, etc., from cases of influenza, it was decided to attempt to obtain cultures from the virus by means of the method used by Noguchi. We had always obtained uniformly negative results in attempting to culture different filtrates, using the ordinary media employed by us in investigating the bacteriology of sputum, *post-mortem* material, etc., from cases of influenza—that is, serum broth, blood agar, heated blood agar, etc.

Although the work is incomplete, we consider that the results are definite enough to warrant publication.

In November, 1917, Foster reported[3] that in studying the etiology of common colds he had been able to isolate an organism by means of Noguchi's methods, and that he had reproduced the disease in human beings by means of nasal instillation of his culture. His method and technique are described in great detail in his monograph, and we have followed them as closely as was possible in a laboratory in the field.

Preparation of Noguchi Culture Tubes.

At first we had great difficulty in obtaining a supply of ascites fluid, and our earlier experiments were made with human blood serum with negative results. This is not surprising, as it is recognized that blood serum tends to inhibit the growth of filtrable organisms, that of poliomyelitis being an example.

Finally, a case of general polyserositis occurred and a litre of clear amber-coloured ascites fluid was obtained and proved to be sterile.

Special tubes were obtained measuring 1 cm. by 20 cm. These were sterilized by hot air and filled with ascites fluid to within 6 cm. of the top. These tubes were then allowed to stand five days at 37° to eliminate the possibility of contamination.

To obtain sterile rabbit kidney Foster's technique was followed as closely as possible. After removal from the rabbit a small portion of kidney was placed in each tube and allowed to settle to the bottom. Sterile liquid paraffin was poured into each to within 2 cm. of the top. The tube was then plugged again with cotton and a rubber cap put on and they were allowed to stand for one week before being used.

When cultures were made, the material to be cultured was drawn up into a long teated capillary pipette, and then expelled until it had formed a drop on the tip when the pipette was quickly plunged through the paraffin and ascites fluid to the kidney, and the material all expelled to within 3 or 4 cm. of the tip. The pipette was now withdrawn quickly, and the tube plugged again.

Staining Methods.

When it was desired to examine microscopically material from the bottom of the tube, this was obtained with a capillary pipette and the pipette broken off above any oil that might have clung to it. A few drops were then placed on a slide, spread slightly, and allowed to dry in the open air upside down. They were fixed for one hour in pure methyl alcohol, and stained for twenty-four hours in 5 per cent. Giemsa, always having the smear downward to prevent any stain from depositing.

Foster stated that one should see in uninoculated tubes in twenty-four to forty-eight hours only a clear zone of haemolysis above the kidney, and possibly a very faint opalescent zone, but nothing more, and we have confirmed

this. Even the haemolytic zone may be very faint if the animal from which the kidney was removed had been thoroughly exsanguinated.

When we first commenced the cultural work, in December, 1918, we were temporarily somewhat short of animals. This fact led to our obtaining our first culture from the kidney of an infected animal instead of directly from the material from human cases. This came about in the following way:

Wishing to prepare some Noguchi tubes, and having no normal rabbits from which to obtain the tissues, we used the kidney from a rabbit that had been inoculated with a filtrate of influenza sputum, and which had reproduced the characteristic signs in its lungs. The Noguchi tubes thus prepared were placed in the incubator to ensure their sterility. In twenty-four hours a clear pale-red zone had developed above the tissue, and in forty-eight hours it was noticed that a faint cloud was appearing. In seventy-two hours this had increased, and a week later the cloud was about 3 cm. high, and a fine deposit had begun to settle on the bottom of the tube. The cloud showed no tendency to blend with the clear ascites fluid above and was rather more dense immediately above the kidney. The culture was examined by subculturing for the presence of any non-filtrable contamination, and this was found to be absent.

On the thirteenth day a smear was made and stained with 5 per cent. Giemsa for twenty-four hours after fixation in methyl alcohol for one hour. In this smear the following appearances were noted:

Numerous small coccoid bodies, in size varying from about 1 μ to 2 μ, and generally single but often taking on a diplococcal arrangement and sometimes occurring in small agglomerations. Some showed a rather delicate halo, the significance of which has not been determined. With Giemsa, they usually stained a deep purple, but some, which were apparently degenerate, were paler in colour and of a pinkish tinge. On this particular occasion the cocci were Gram-negative, but it has since been shown that very young cultures may be Gram-positive.

The cloudy material was transferred to other Noguchi tubes and the same phenomena occurred. Smears made from the resulting subcultures, stained with Giemsa, showed the same picture as described above.

Animal Experiments with Cultures.

Experiment No. 1.

Original cultures were put up on December 15th, 1918. On December 28th, when the cultures were thirteen days old, a mouse was inoculated subcutaneously with 0.25 c.cm. of the original culture. It died six days later. Its lungs showed some haemorrhagic areas.

Post mortem its kidneys were removed with aseptic precautions, and implanted in a Noguchi ascites fluid tube. A subculture was obtained, but not proceeded with further.

A rabbit was also inoculated intravenously with 1 c.cm. of the culture. It was killed seven days later, and, although the lungs of the animal did not show any typical signs of a marked infection, a culture was obtained from the rabbit's kidney.

In addition to these animal inoculations, subcultures of this virus were made on December 28th, and a definite cloud was obtained. Fifteen days later, on January 12th, 1919, these cultures were mixed together, and the following animals were inoculated as shown in the table below.

At the same time as the animals were inoculated the subculture R.2 was inoculated into another Noguchi tube. This culture produced the usual cloud, and the smear showed the presence of the typical coccoid bodies. Thus the third generation by direct subculture has been reached, and at the time of writing it has not yet been taken further.

Besides these experiments we have also succeeded in growing the organism: From a filtered sputum from a case of influenza—this also has been carried through to the second generation; from the filtered lung extract of Baboon 12; from the kidney of another infected rabbit.

Controls.—The kidneys from normal rabbits when cultured in Noguchi tubes have failed to produce these organisms on culture, as also the kidney from a monkey inoculated with sputum from a case of simple acute bronchitis.

Conclusions.

The number of experiments carried out by us is too small to justify the drawing of final conclusions. These experiments were brought to an end by the cessation of the epidemic, and the loss of laboratory attendants consequent on demobilization. We feel, however, that we are in a position to make the following deductions from our work:

I. The apparent immunity of some animals to filter-passing viruses and the occasional difficulty of the transmission of these viruses by means of blood is well known. When this is taken into account the number of positive results obtained by us would seem to be significant.

II. The pathological lesions in what may be called experimental influenza in animals closely resemble those seen in the lungs of men.

III. There is some evidence in favour of the view that the passage of the virus from one animal to another may raise its virulence.

IV. Inoculation of the filtered and unfiltered sputum taken from cases of influenza, especially at an early stage of the disease, has been found to produce lesions in the lungs in a high proportion of inoculated animals. The inoculation of blood may not always produce such striking results.

V. A minute micro-organism of a coccoid shape may be grown by Noguchi's cultural methods from: (*a*) The kidney of infected animals; (*b*) the filtrates of lung tissue, and (*c*) the filtered sputum from cases of influenza. The cultures have been carried by us to the third generation by direct culture. The cultures when inoculated into animals produce typical "experimental influenzal" lesions, and cultures can be recovered again from the animals so inoculated.

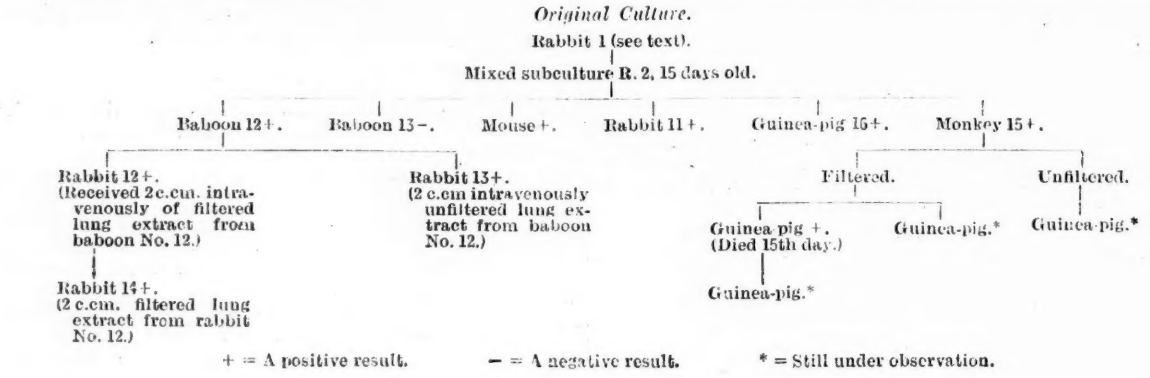
VI. In view of these findings we consider that there are very strong grounds for considering that—

(*a*) The organism isolated by us is capable of passing through a filter.

(*b*) That it is in all probability the cause of influenza as seen to-day.

A similar organism, having the same properties, has also been described by Captain J. A. Wilson, R.A.M.C., working quite independently at No. 20 General Hospital.[4] Since the publication of his work on this subject we have shown him our preparations, and he considers the organism isolated by us to be the same as his own, in which opinion, after examination of his slides, we are in agreement.

We are indebted to the Medical Research Committee for providing the material for the work; to Colonel S. L. Cummins, C.M.G., A.M.S., Adviser in Pathology, British Armies in France, for valuable advice; to the Officers Commanding No. 2 Stationary Hospital and No. 3 Australian General Hospital for allowing us the use of the laboratories attached to their hospitals; and to the Officer Commanding No. 2 Stationary Hospital for the use of his wards.


Original Culture.
Rabbit 1 (see text).
Mixed subculture R. 2, 15 days old.
Baboon 12+.
Baboon 13−.
Mouse +.
Rabbit 11 +.
Guinea-pig 16+.
Monkey 15 +.
Rabbit 12+. (Received 2c.cm. intravenously of filtered lung extract from baboon No. 12.)
Rabbit 13+. (2 c.cm intravenously unfiltered lung extract from baboon No. 12.)
Filtered.
Unfiltered.
Guinea-pig +. (Died 15th day.)
Guinea-pig.*
Guinea-pig.*
Rabbit 14+. (2 c.cm. filtered lung extract from rabbit No. 12.)
Guinea-pig.*
+ = A positive result.
− = A negative result.
* = Still under observation.

The help of Private Webster, A.I.F., and Private Whally, R.A.M.C., has been invaluable in the care of the animals, and our thanks are also due to Private Urquhart, R.A.M.C., our laboratory attendant, for much hard work in the preparation of media.

NOTE BY COLONEL S. L. CUMMINS, C.M.G., A.M.S.,

Advisor in Pathology, British Armies in France.

While Major H. G. Gibson, R.A.M.C., was actually engaged in preparing the above summary he was himself attacked by the disease in its severest form. He and his colleagues had been working for long hours in the laboratory at cultural and passage experiments with the organism believed to be the "filtrable virus" of influenza, and the attack found him overdone and weary from his self-forgetting efforts to solve a problem of pressing military and general importance. Major Gibson had no opportunity of revising or even finishing the summary, which has had to be completed from his notes and records.

His death, a grievous loss to medical science and to the Royal Army Medical Corps, was still such an end as a soldier would have chosen. Laborious tasks cheerfully undertaken and dangers resolutely faced are no less glorious in the laboratory than in the trenches.

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SYMPTOMS OF HYPERTHYROIDISM OBSERVED IN EXHAUSTED SOLDIERS.

BY

W. JOHNSON, MAJOR R.A.M.C.(S.R.).

THE close association between emotional states and Graves's disease has long been pointed out. During the course of the present war reference to mild conditions of the disease occurring in soldiers has been fairly frequent, and warrant a consideration of the question of the relation between emotion and hyperthyroidism.

In the later part of the year 1917, in a certain forward area, I was able (largely with the help of Captain F. S. Walker, R.A.M.C.T.) to observe and take brief notes on fifty cases in which the condition was clinically demonstrable. These cases were admitted into a centre for psychoneuroses and formed a small percentage of the total admissions.

EMOTIONS AND THE INTERNAL SECRETIONS.

The observations of Cannon have thrown considerable light on the intimate relation existing between emotions and the internal secretions.

Beginning by directing attention to the fact that the well known manifestations of emotional states (for example, pallor, blushing, palpitation, increased cardiac and respiratory action, etc.) are all evidence of sympathetic nervous activity, he proceeded to investigate the question of how an emotional upset produces such results. By experiments on animals kept in a state of fear, anxiety, and anger, he was able to demonstrate that suprarenal activity was stimulated; and that an increase in the adrenin content of the blood in the suprarenal vein could be demonstrated. Adrenin acts by direct stimulation of that portion of the sympathetic nervous system which is styled the vertebral sympathetic or the sympathetic proper. It is therefore seen that it is the increased output of adrenin, by producing profound sympathetic activity, which is responsible for the physical manifestations of emotion.

Cannon also points out that the sympathetic activity produced by increased adrenin secretion is all directed towards toning up and sustaining the physical powers for battle—that is, the staying power. Without going into the question of the relative degree to which the various organs of internal secretion may be involved in the production of this result, it seems certain that, at least, the suprarenal and thyroid glands are two of the most important.

Increased adrenin secretion causes:

1. An increase in the blood sugar;
2. An improvement in the contraction of a fatigued muscle;
3. An increase in the coagulability of the blood;
4. A rise in the blood pressure by constricting the splanchnic area.
5. An increase in force and frequency of the cardiac beat.

In view of the cases about to be described, I add here the generally accepted view of the function of thyroid secretion.

1. It is said to reinforce the action of adrenin.
2. When it is absent or diminished, conditions of mental inactivity—that is, myxoedema and cretinism, result.
3. Where it is present in excess there is a state of mental excitation.

In an individual who is exposed to emotional stress for weeks—sometimes months—without being able to perform the active bodily movements (fighting, running, etc.) which are the natural expression of the emotion, the increased internal secretions which have been produced in his body become, as it were, "a drug on the market." Their physiological circle is uncompleted, and where the emotional state has been excessive and prolonged—as was the case with soldiers under recent military conditions—it seems possible that the accumulation of the excessive products of internal secretion in the body may produce pathological conditions.

It would appear, then, that the various symptoms exhibited by men breaking down in the line have a definite basis. The patient presents those states which are recognized as being produced by sympathetic activity, but he presents them in a riotous way. He has palpitation and tachycardia, disordered activity of the alimentary canal, dilated pupils, protrusion of the eyeballs, sweating and vasomotor disturbance. Added to these are the various subjective complaints which are the results of these states—that is, headache, dizziness, dyspepsia, indigestion, loss of weight, weakness on exertion, and that general unhappy condition described by the patient as "nervousness." In this latter term he includes that feeling of irritability which he is distressed to find he is unable to control.

In a recent paper[1] it was stated that a series of cases, belonging to the group of irritable heart, psychoneuroses, etc., showed a hyper-susceptibility to injections of adrenin. The present paper supplies evidence that in the early days of severe exhaustion, symptoms attributed to hyperthyroidism may be observed. These symptoms were observed within a few hours of the patient leaving the battle line, and it was found that, after two or three weeks' rest, marked amelioration of the condition occurred. Details as to the particular nature of the fighting and the relation to the total number of psychneuroses admitted during the time cannot be given, and systematic and scientific investigation was impossible under the circumstances.

Clinical Description.

In the first two cases that drew attention to the condition exophthalmos was pronounced and there was definite enlargement of the thyroid gland. In five other cases only was any increase in size of the thyroid gland noted, and in these the enlargement was limited to one or other lobe. The clinical picture of Graves's disease was, in all these cases, complete.

In the remaining forty-three cases it could not be said that the thyroid gland showed any alteration in size, although in many there was a slight fullness about the neck. The degree of exophthalmos, however, sufficed to occasion remark and to call for special observation and examination. It then became apparent that the whole fifty cases formed one clinical group and varied only in the degree with which the symptoms were exhibited.

The ages of the patients varied from 21 to 43 years—the majority being between the ages of 23 and 35. In only one

case was a history obtained of a previous condition of exophthalmos.

In general appearance the man was pale, looked ill, and was exhausted. There had usually been a recent loss of weight. The whole surface of the skin was soft and moist, and, in many cases, beaded with perspiration. The extremities, as a rule, were cold and cyanosed.

The mental state was usually one of subdued excitement. The patient would be worried and troubled, and possessed very little or no emotional control. Some had struggled to remain at duty and were ashamed at having broken down. A few had been sent to hospital as the result of being blown over by shell explosions, but the majority had broken down under the strain of heavy fighting. A serious result of this state of mental tension is the excessive irritability which these patients show. A very slight disturbance or noise at night is sufficient to waken them, and once awake their mental activity successfully banishes all possibility of sleep. This irregularity in sleep had frequently lasted for weeks.

Prominence of the eyes, more or less marked, was exhibited by all the cases. The facial expression was one of fear and anxiety. In some the exophthalmos was so pronounced that the eyes seemed to be starting from the head, and the patient, when handed a looking-glass, has been astounded at his own appearance. As a rule, however, the amount of sclerotic visible round the corneal margin was small and the result was a definite staring expression. In all cases von Graefe's sign (that is, lagging of the upper eyelids when the eye is made to follow a slow downward movement of the finger) was well marked. Joffroy's sign (that is, absence of wrinkling of the forehead on looking up) was found in those cases in which exophthalmos was most pronounced.

Muscular System.—Ordinary muscular movements were carried out in a quick, excitable manner, and any effort easily produced sweating and a sense of fatigue. As a rule, the inability to sustain ordinary exertion was the most common subjective condition.

Tremor was a constant phenomenon. Occasionally it could be observed—affecting the arms and head—as the patient lay quietly in bed. It could always, however, be brought out by causing the arms to be held horizontally in front of the body. It was then seen to be very fine and rhythmical, affecting more especially the fingers. If the man was made to stand up, a slight general tremulous condition could be observed affecting the whole body.

Reflexes.—The nervous reflexes showed slight alterations. The pupils were usually slightly dilated, and gave a slow diminished reaction to light. The tendon reflexes were always exaggerated, and in a few cases unsustained patellar and ankle clonus were obtained. The pilomotor reflex was more frequently absent than present. The line produced on the skin in performing this test was usually abnormally red and persistent.

The subjective symptoms varied widely. Usually the man said he had become "nervous and weak," that he suffered from throbbing headaches, dizziness, palpitation, and precordial pains, more especially on exertion. Digestive discomfort and diarrhoea were complained of more rarely. A few had frequency of micturition. Sleep would be irregular and easily disturbed. Dreams, in which the patient would wake up in a profuse perspiration, were common.

The whole general state of the individual was one of querulousness and anxiety—the attitude of the man who feels that he cannot drive himself one step further.

Case 1.—Pte. C., aged 35, prior to the war had lived all his life in Manchester. He had got thinner during the past six months, and now suffered from headache, perspirations, and general weakness. He broke down in the line. The hands were purplish-blue and showed a fine tremor. The pulse, taken in bed, was 90. There was slight prominence of the eyes, and well defined von Graefe's sign. The right side of the thyroid gland was enlarged.

Case 2.—Pte. T., aged 26, on admission complained of headache, had a general tremulous condition; speech was hesitating. The eyes were very staring and prominent, and von Graefe's sign was marked. The pulse, taken in bed, was 84. The thyroid appeared normal in size.

Case 3.—Pte. A., aged 31, complained of feeling weak and unable to stand shell fire; he had felt ashamed of his condition, and had tried his utmost to keep himself controlled. He was thin, said he easily got short of breath, and that he sweated profusely. The thyroid was apparently normal. The pulse, taken when up, was 120. The eyes were prominent; von Graefe's sign was slight.

Case 4.—Pte. F., aged 40, was admitted mute, a shell having dropped within twenty yards of him. He had lost weight in the last two years, and now suffered from headache, palpitation, dyspnoea on exertion, and profuse perspiration. The pulse, taken when up, was 130. The hands were tremulous, and there was marked prominence of the eyeballs. Von Graefe's sign was present. There was fullness of the thyroid on the right side.

Course.

It was found that after a rest in bed (with full diet, suitable tonics, and occasionally Dover's powder at night) the condition of all patients rapidly improved in ten to fourteen days. At the end of that time the exophthalmos had greatly decreased, and in about half the cases had disappeared altogether, although von Graefe's sign was still slightly positive. The pulse remained rapid and excitable, and the general subjective symptoms always appeared to be within call if the patient experienced any excitement. It is of interest to point out here that Dr. Hale White has described cases of Graves's disease in which not only improvement but apparently complete recovery had occurred. It is, unfortunately, impossible to give the later history of the patients described in this paper. A few I kept for a month were still unfit for duty at the end of that time. The remainder were evacuated to the base after two or three weeks' observation.

Observations on Cases.

1. *Heart.*—The condition described in connexion with "effort syndrome" was frequently found—the cardiac impulse being diffuse and heaving in character. In a few cases a well marked soft systolic murmur was to be heard over the base of the heart when the patient was lying down. It was loudest over the third or fourth left intercostal space close to the sternum. It disappeared on the patient standing up or after two or three days' rest in bed. In the majority of cases the apex beat, on palpation, extended $\frac{3}{4}$ in. or more outside the nipple line.

2. The *pulse rate* varied within a wide range in the one individual without appreciable cause. The rate which had been 80 or 90 in bed would become 120 to 130 when the patient had walked a little while. Captain Walker took a careful series of pulse rates and found that this condition still persisted at the end of three weeks. The accompanying chart shows this, as also the fact that at first the pulse rate in bed takes a few days to settle down to an average of about 80, and then remains at that figure, while the "up" pulse rate keeps a fairly constant level the whole time.

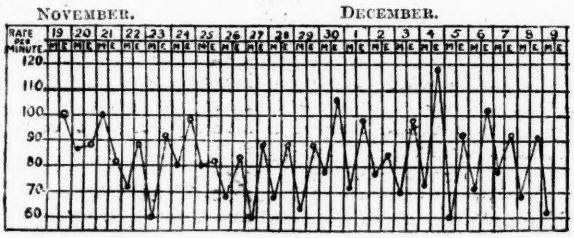
NOVEMBER.
DECEMBER.
RATE PER MINUTE
19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9
M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E
120
110
100
90
80
70
60

Chart showing morning pulse taken in bed, and evening pulse, taken after the patient had been up a few hours. It illustrates the abnormal excitability of the pulse rate in these patients.

3. *Blood Pressure.*—The observations we carried out showed wide variability of the maximum pressure at the wrist in different patients. It ranged from 126 mm. to 148 mm. of mercury, and did not appear to show any relation whatever to variation of the pulse rate.

4. *Vasomotor State and Sweating.*—Abnormal condition was the rule. On parade I have noticed a patient exhibiting pallor and sweating of the face, associated with a cold, moist, and dusky cyanotic condition of the hands. The same patient put to bed has presented in a short time a flushed face, hands moist and warm and a reddish-purple colour. In both states there appears to be vasomotor stasis, as pressure with the finger easily empties the vessels, and the colour takes an abnormal time to return.

5. *Blood.*—Samples of blood from six patients failed to show the presence of any hyperglycaemia.

6. *Urine.*—In about one-third of the cases the urine was tested and no reduction of Fehling's solution occurred.

7. *Adrenalin Test.*—Two drops of the ordinary adrenalin solution (1 in 1,000) were dropped into the eye in a few cases. No alteration in the size of the pupil or change in the pulse rate was observed. It is hoped to reinvestigate with various strengths of adrenalin this test, which may prove to be a highly important one.

8. *Effect on the Pulse Rate of Deep Pressure on the Eyeball.*—The result was not constant. In one marked case the pulse rate dropped from 130 to 90; in another the pulse died under one's fingers and became quite imperceptible; and in yet another the pressure in the pulse seemed to decrease markedly, and the rate fell from 120 to 100. In the normal person the pulse rate is retarded 6 to 10 beats a minute.

It is not out of place here to mention that, a short time previously to observing these cases, Lieutenant W. R. Stuart, R.A.M.C., and I made similar observations on 200 cases of men who were in need of a rest from the line. In these the heart, pulse, and vasomotor condition were all very similar to what has been mentioned above, and in fact the patients, with the exception of there being no exophthalmos, presented an identical clinical picture.

SUMMARY.

The points which I desire to draw attention to are:

(*a*) The occurrence of a definite condition of exophthalmos in exhausted soldiers.

(*b*) The fact that this exophthalmos is present in the early stage of advanced conditions of exhaustion, and that it is only temporary, lasting usually two to three weeks.

(*c*) When it disappears the patient at once merges into the group of cases labelled "neurasthenia," and is indistinguishable from them.

The following hypothesis therefore appears possible:

1. That a large number of so-called psychoneuroses are cases in which the symptoms are due to a state of disordered internal secretion the result largely of emotional exhaustion, and, to a less degree, of physical exhaustion.

2. That many cases which are later diagnosed irritable heart, D.A.H., soldier's heart, and neurasthenia, are really cases of this class, and that possibly many have passed through a slight state of exophthalmos without its importance being realized.

I would therefore suggest the advisability of classing the whole group under a suitable term.

Exhaustion syndrome would appear to be most applicable, and would possess the great advantage of not suggesting a period of chronic invalidism—such as a soldier associates with D.A.H., neurasthenia, and similar terms.

Having observed some thousands of cases of breakdown in the line—in men otherwise healthy—I have become impressed by the fundamental unity of the group, and by the fact that exhaustion is the active etiological factor.

[I am indebted to Lieut.-Colonel Gordon Holmes for helpful criticism in the arrangement of this paper.]

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NOTE ON HAEMORRHAGIC SPINAL EFFUSIONS.

BY

COLONEL W. P. S. BRANSON, A.M.S.

(By leave of the Director-General Medical Services, British Armies in France.)

I HAVE lately seen two examples of a malady which is new to me, and I wish to put this brief note of them on record, incomplete though it is, in order to elicit information.

The cases occurred in Belgium in January, 1919. Both patients were British private soldiers of different units, and the influenza epidemic was still severe among the troops in the neighbourhood. The patients were treated in No. 48 Casualty Clearing Station at Namur.

C

General Clinical Features.

The clinical features of the illness were so nearly identical in the two cases (with exceptions which will be noted) that one description will serve for both.

The patient fell ill suddenly with extreme frontal headache and stiffness of the neck, and vomited once or twice but no more. He was practically afebrile throughout, though a twelve-hourly chart showed fitful elevations of temperature to 100° F. or less. His face had the peculiar subcyanotic tint so characteristic of the present epidemic of influenza. Mentally he was clear and exhibited none of the lethargy and torpor to be expected in a victim of cerebro-spinal meningitis having the same degree of headache. The pulse rate was normal and no complaint was made of generalized aching. Kernig's sign was not conclusively present.

Lumbar puncture (in one instance on the second day of the disease, in the other on the fourth) produced 40 to 50 c.cm. of a highly bloody fluid, under considerable pressure. A test tube full of this fluid left standing for twenty-four hours showed a clear supernatant fluid and a deposit of blood cells in about equal proportions. Repetition of the puncture on the two succeeding days produced 30 to 40 c.cm. of a similar fluid, but visibly less bloody. By this time in each case amelioration of symptoms was so far advanced that nothing further was done. One patient was evacuated to the base, convalescent, the other had reached the seventeenth day of his illness when I last heard of him and bade fair to make a good recovery, though both of them were slow in getting rid of their headaches.

Examination of Spinal Fluids.

The examination of the spinal fluids was carried out under great difficulties (his laboratory being some twenty miles away) by Captain G. A. Wyon, R.A.M.C., of the 19th Mobile Laboratory, to whom I am indebted for the following particulars:

1. No organisms could be found in films (five examinations).
2. Each spinal fluid was cultivated twice and all the cultures remained sterile.
3. The cytology of the fluid is uncertain. In one case no count was made, but Captain Wyon's clear impression is that polymorphonuclear leucocytes predominated, and were in excess relatively to the red blood cells. In the other case a single relative count of leucocytes gave the following result: Polymorphonuclears 96 per cent., lymphocytes 3 per cent., large mononuclears 1 per cent.

Differences between the Cases.

I spoke above of items not common to both patients.

(*a*) The first patient was taken ill at the conclusion of a three days' journey in a lorry, and a note from his regimental medical officer said that a number of men who had made the same journey had been seized with headache and vomiting and themselves attributed their symptoms to gassing by petrol fumes while in the lorry. We, however, in the casualty clearing station saw no more of these patients, so that it is to be presumed that the symptoms were fugitive.

(*b*) The second patient had made no such journey, and he also differed from the other in two subordinate respects: (1) He had a persistent cough, with expectoration; (2) the stiffness of his neck was associated with a band of bilateral hyperaesthesia (which he plotted out spontaneously in the most certain fashion). This band was about 2 inches broad, and ran downward from the cervical spine along the upper border of the trapezius to the top of the shoulder on each side.

Commentary.

I do not know what this ailment was, but it pretty certainly was not cerebro-spinal meningitis, of which disease I saw a few sporadic cases at about this time. At a guess I should say it was a variety of influenza, mainly because the complexion of its victims was that of the influenzal, and I have not observed that peculiar bluish flush in any other malady.

I saw the same flush in another anomalous patient during this period. His symptoms were high fever, lethargy, and right hemiparesis. His cerebro-spinal fluid was perfectly clear. He recovered in about three weeks, sufficiently, at least, to be sent to the base convalescent. I called his ailment "lethargic encephalitis" on the score

of what I had read and for lack of a better name, but it seems to me likely enough that it also was a variant of the influenzal picture.

I shall be grateful to any reader who can help me to more knowledge of the above-described variety of haematorrhachis.

SOME BACTERIOLOGICAL FINDINGS IN EPIDEMIC INFLUENZA.

BY

CAPTAIN WILLIAM T. MUNRO, R.A.M.C.

ACTING on instructions, I visited the Duke of York's Training School, Brentwood, on October 14th, Hare Hall Camp, Romford, on October 16th, and Purfleet Military Hospital on October 22nd. Serious outbreaks of influenza were reported from these three centres.

At the Duke of York's Training School, Hare Hall Camp, Romford, and Purfleet Military Hospital, it was decided to take nasopharyngeal swabs. Keeping in mind that two cases died of cerebro-spinal fever during the July epidemic of 1918 (cases which had been missed among the large numbers suffering from influenza), it was thought advisable to inoculate serum trypagar plates as well as plates of blood-smeared agar; thereby it was hoped that the possibility of any cases being meningococcal carriers might be eliminated; by blood-smeared agar it was hoped to grow Pfeiffer's bacillus, should it be present.

At Brentwood fifty boys suffering from influenza were examined in this way. A striking feature clinically was the injection of the tonsils and the swollen uvula. Most of the boys had high temperatures, and were decidedly ill. At the time of examination there were none with serious pulmonary complications. West's swab was always used, so as to avoid contamination with the *Streptococcus salivarius*. It was found that a streptococcus was present in 40 out of 50 swabs plated; it was strongly haemolytic, similar to the *Streptococcus anginosus*. The pneumococcus was present in several cases; *Micrococcus catarrhalis* was also present. In two cases only was the influenza bacillus found, and no plate showed a meningococcus.

The cases at Hare Hall Camp, Romford, did not seem so severe. Fifty men were swabbed; streptococci and staphylococci were the predominating organisms. Two cases showed meningococcal-like colonies, but these did not agglutinate with any of Gordon's four types of serums. The bacillus of Pfeiffer was not found.

In Purfleet Military Hospital were several cases which had gone on to pneumonia or bronchopneumonia; the chief unit from which the cases came was a Canadian Railway Troop Dépôt. There were about 3,000 Canadian troops in this area, some from recent drafts, and many men who had never been ill in their lives. Swabs were taken from fifty of these men; thirty-one showed a streptococcus to be the predominating organism. None of these men complained of illness, though some showed injected fauces. The meningococcus was not found, and no plate showed the influenza bacillus. Unfortunately Matthew's medium was unknown to me at the time these swabs were taken, and the later medium used by me for the isolation of Pfeiffer's bacillus had not been prepared.

Examination of the Sputa of Cases of Influenza, and Pulmonary Complications following Influenza.

Over 150 sputa were examined by film and by culture. For slide examination a small greenish-yellow portion of the sputum was spread in a thin film, stained by Gram and counter-stained by a solution of ordinary carbol-fuchsin diluted 1 in 10 with sterile water. This was allowed to act for ten minutes. In about half the number of sputa examined short Gram-negative bacilli were found on the slide.

In some specimens these occurred in enormous numbers, but there was never wanting plenty of Gram-positive diplococci and streptococci.

Gram-negative diplococci were also seen and none of these proved to be a meningococcus. They were probably *Micrococcus catarrhalis* or members of that group. Staphylococci were seen fairly commonly.

Cultures.—In the first series of specimens the sputum was spread on blood-smeared agar, similar to that used for the nasopharyngeal swabs. In only one instance was Pfeiffer's bacillus grown, and this from a case not called influenza but a purulent bronchitis. In all cases of pulmonary complications pneumococci and streptococci were grown in culture from the sputa. It occurred to me that an agar medium neutral in reaction to phenolphthalein and containing blood or a solution of haemoglobin would be better for the growth and isolation of Pfeiffer's bacillus. Human haemoglobin was used. When patients were sent for the Wassermann test blood was taken under strict aseptic conditions, the serum kept for the Wassermann test, the haemoglobin was dissolved out and added to 3 per cent. trypagar. This medium proved much more suitable for all purposes. It was fairly clear and if a small greenish-yellow part was picked out from the sputum it was common to find the influenza bacillus at the end of twenty-four hours. Its growth was slow. It appeared as small dew-like colonies not attaining to any size until about the third day. It was not always easy to grow these on subcultures, but it was done in slope culture of the same medium. About fifty sputa were cultured on haemoglobin trypagar and the influenza bacillus was found in forty of these plates. It is worthy of note that blood smeared agar was used in the first 100 sputa examined and Pfeiffer's bacillus was only isolated on a very few occasions. I had used, for the most part, my own blood to smear the agar, and I suffered from an attack of "influenza" in July; this may have had something to do with the want of success.

Summary.

The principal organisms found in the material examined were pneumococcus, streptococcus, the influenza bacillus, staphylococcus, and *Micrococcus catarrhalis*. At the time of the investigation the laboratory did not hold a licence, so that it was not possible to test the pathogenicity of any organism. It is suggested that the influenza bacillus was probably present in all cases at the beginning of the illness and that the pneumococcus and the streptococcus were mainly responsible for the pulmonary complications. It is seen that the influenza bacillus could be recovered in 80 per cent. of the cases on a medium containing human haemoglobin. The influenza bacillus requires some determination, and it is pointed out here that what is taken as the influenza bacillus is a short Gram-negative bacillus growing on a blood medium and showing in twenty-four hours small pin-point colonies. These will not grow in subculture on ordinary agar. Further, the influenza bacillus is difficult to stain. It does not show up well stained by Gram and counter-stained by neutral red. It is better to use a dilution of 1 in 10 of ordinary carbol-fuchsin, and counter-stain for ten minutes.

A further report dealing with the results of vaccine therapy in these cases will be submitted by the physicians of the Military Hospital. The complete examination of the results obtained by vaccines prepared in the district laboratory will require considerable time.

I wish to record my indebtedness to my colleague Dr. Hugh Vallance, who has all along been associated with me in the work of this laboratory.

A TYPHOID CARRIER FOR THIRTY-SEVEN YEARS.

BY S. T. CHAMPTALOUP, M.B., B.Sc.(P.H.),

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WHILE investigating a case of typhoid fever which occurred at S——, in the Central Otago district (N.Z.), Inspector Armour, of the Government Health Department, suspected A. M., the subject of this note, to be a carrier, and requested him to go into hospital at Dunedin for examination. The facts are as follows:

A. M., male, aged 72, single, had worked at sheep-shearing, bush-falling, and as a general farm servant in and about the same district for nearly forty years. He had never been engaged in cooking or otherwise handling food at the farms or stations at which he worked. On being interviewed in Dunedin, the old man was rather proud of the fact that he had escaped infection in several outbreaks of typhoid fever to which many of his mates had fallen victims. He stated that he had had typhoid fever in 1881, when he was admitted to the Clyde Hospital suffering from fever, severe headache, and painful diarrhoea. He suffered a relapse, and was in hospital thirty-seven weeks; from his account he was evidently seriously ill. At the same time there were several cases of typhoid fever in the district, five of which were admitted to the same hospital as A. M., and two were fatal. The medical practitioner who was in charge of the hospital is long since dead; but I have elicited these facts from the old man in support of his contention that the illness from which he suffered in 1881 was typhoid fever. He gave the following subsequent history.

1. Shortly after having recovered from his attack of typhoid fever he was one of a party of shearers at P—— station where typhoid fever broke out, and there were 13 or 14 cases amongst his mates, of whom several died.

2. Two or three years later he was shearing at W——, and three of his fellow shearers contracted typhoid.
3. Three years later he was shearing at A——; the cook and several of the shearers contracted typhoid.
4. Two years ago he was shearing at L—— when a fellow shearer contracted typhoid. (The diagnosis in this case I know to have been confirmed.)
5. His last association with the disease was at S—— in the autumn of 1918, when he was engaged as a general farm servant. A rabbiter, E., came to the farm shortly afterwards, occupied the same room, and shared his meals with A. M. E. was admitted to Dunedin Hospital suffering from typhoid fever in June, 1918 (agglutination and faeces positive), and it was while investigating this case that the inspector came across the carrier.

At the time of my interview A. M. seemed a hale, sturdy old man, and, but for his attack of typhoid fever in 1881, he had had no serious illness, and had always been remarkably well. No history of gall stones or gastro-intestinal attacks could be elicited.

Laboratory Note.

Blood, urine, and faeces were first submitted for examination on July 9th, 1918, and subsequently at intervals, with the following results:

Agglutination Reactions (Dreyer's technique).—The patient's serum agglutinated his own bacillus up to 1 in 300, and agglutinated the standard (Oxford) strain of *B. typhosus* up to 1 in 250. The reactions were repeated on two occasions at intervals with similar results.

Urine.—No typhoid bacilli were found at any time by direct plating, plating after preliminary incubation, or by enrichment methods.

Faeces.—Very numerous typhoid colonies on MacConkey plates, and in almost pure culture, were found on July 9th, 1918. There were numerous typhoid colonies on July 18th; a few on August 2nd, 15th, and 29th. The colonies were numerous again on September 5th; there were a few on September 25th, and on October 24th they were once more numerous. Enrichment methods were unnecessary in the case of the faeces, as the bacilli were easily recovered by direct plating from preliminary emulsions. The technique followed was that outlined by Henderson Smith (BRITISH MEDICAL JOURNAL, July 3rd, 1915). The isolated bacilli agglutinated to titre with the typhoid serum of the Lister Institute.

A. M. was kept under observation in the isolation hospital for four months, during which time many of the recognized methods of treatment were tried, but without avail, as the faeces examinations indicate. He was meanwhile trained in habits of cleanliness, and, as he now fully realized his potentialities for danger to his fellows, he was discharged and instructed to report to the Public Health Department from time to time.

The Milroy Lectures

ON

HALF A CENTURY OF SMALL-POX AND VACCINATION.

DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS OF LONDON.

BY

JOHN C. McVAIL, M.D., LL.D.

VACCINATION AS IT WAS AND IS.

The Law.

NEITHER infantile nor re-vaccination has ever been compulsory on the population of the United Kingdom. The utmost penalty has been the infliction of fines, and non-payment of a fine has sometimes involved imprisonment, but the law has never allowed a child to be taken out of its mother's arms and forcibly vaccinated.

Various changes have taken place in law, practice, and doctrine since 1870. Vaccination was made obligatory in England in 1853. Boards of guardians were empowered to appoint vaccination officers in 1867; appointment of these officers was made compulsory in 1871. In 1898 domiciliary vaccination was to a great extent substituted for vaccination at public stations, and systematic asepticism in the operation was insisted on and arranged for. At the same time exemption on the ground of conscientious objection was enacted. The procedure for obtaining exemption was made easier in 1907. Public vaccinators and vaccination officers are under the Poor Law authorities, not under the health authorities, as obviously they ought to be. The age for obligatory vaccination has been raised from three months to six months, as in Scotland.

In Scotland the obligatory law was passed in 1863, but the duties of public vaccinators were and are confined to defaulters who have omitted to secure the vaccination of their offspring before the age of 6 months. For the rest, vaccination is the concern of the private medical attendant and the child's parents, excepting for certain public vaccination stations where medical students are educated. Exemption since 1907 is obtainable even more easily than under the English Act.

Revaccination is entirely voluntary in both countries.

Decline in Practice.

Systematic practice of infantile vaccination has greatly diminished in recent years. At the same time that small-pox has become a much less prevalent and much less fatal disease than before, exemption from vaccination has been made very easily obtainable, and the Jennerian prophylaxis has largely fallen into disuse. The English Local Government Board's annual tabulation of vaccination returns has been discontinued during the war, so that the most recent statistics relate to the year 1912. At that time about one-half of the infants born and more than one-half of those surviving to the vaccination age were being vaccinated. No doubt vaccinations, in the absence of small-pox and under the easy system of exemption, have considerably diminished since then.

In Scotland in 1916 (the latest year for which figures are available) amongst the children surviving at six months—the statutory age for infantile vaccination—the percentage of unvaccinated was 41. This is a little less than the percentages for the two previous years, but much higher than the rate—6 per cent.—of the years before the Act of 1907, which facilitated the obtaining of exemption certificates.

The Doctrine.

The doctrine of vaccination has mainly altered in respect of, first, the need for revaccination, and, secondly, the value of recent vaccination when small-pox tends to become prevalent. Jenner's one serious error—that vaccination gave lifelong protection—resulted in this country being behind Germany in realizing the need for revaccination. But Marson,[1] giving his experiences of the London Small-pox Hospital, says, "I have always recommended revaccination after puberty," especially for persons indifferently or doubtfully vaccinated in infancy, or without any cicatrix remaining. Dr. Seaton declared in 1875:[2] "The revaccination of persons as they reach about 15 years of age should be as systematically done as is the vaccination of young infants," and he states that he laid down this rule some years previously. Opinion regarding the proper period of life for systematic revaccination has tended to change in the direction of an earlier repetition of the operation, adolescence in the original view having now been replaced by the age of 9 or 10 years, especially in presence of small-pox. Also, although it is generally recognized that, because it is done at an age when the process of bodily growth and development has been largely accomplished, revaccination efficiently performed yields a more prolonged protection than primary vaccination, yet when there is appreciable risk of small-pox infection the operation should again be repeated, especially if many years have passed. In the Local Government Board's Report for 1887 it is stated that "whether the protective influence of this second vaccination becomes impaired, and if so, under what conditions, is not known."

Germany.

This development of view as to the desirability under such circumstances of renewed revaccination will probably be strengthened when we become more acquainted with the facts as to small-pox in Germany during the war. It has always been known that under obligatory revaccination in that country such trivial amount of small-pox as occasionally did occur was to be found mainly on the frontiers, where Germany adjoins very incompletely vaccinated countries like Russia. Two or three million Russian prisoners interned in various parts of Germany have permeated that land to an unparalleled degree, and the risks of infection, which were formerly almost confined to the borders, have accordingly been extended right into the heart of the country. In 1917 in Berlin about 4,000

cases of small-pox occurred, with over 400 deaths. The strong vaccinal defences of modern Germany have, in short, been subject to more strenuous attack than ever before, and the protection which had been sufficient against occasional trivial invasions has been less able to resist the more prolonged and heavier onslaught. A German whose personal immunity had not been absolute was further protected by the generally high standard of immunity of the population, so that his chances of direct infection were few and rare. At the same time, it is reasonable to think that the privations of Germany in respect of the ordinary necessaries of life—food and clothing and heating—taken together with the domestic and public anxieties of the war owing to deaths and disablements, have made the population to some degree more vulnerable to infectious disease. In Germany it should be noted that the male population fit for military service has, broadly speaking, the protection of a second revaccination on entering the army, while females and all males who for one reason or another were not drafted into the army have had only a single revaccination. It will probably be found that mainly in this section of the population has small-pox reasserted itself during the war.

In Germany, or at least in its civil population, forcible vaccination or revaccination has not been the law.[3] The highest penalty is by fine or by imprisonment not exceeding three days, and, as ought to be the case in this country, vaccination and revaccination are on the same legislative footing. The German population, however, has been so drilled in ways of obedience that defiance of the law has been comparatively rare.

Calf Lymph.

In the practice of vaccination a most important change has taken place through the substitution of calf lymph for humanized lymph. The change resulted mainly from a desire to allay parental anxiety regarding the possibilities of conveyance of human disease by means of humanized lymph. This anxiety hardly existed in the medical profession, who freely vaccinated their own children from the arms of infants, the risk being so remote as to be considered practically negligible. The great virtue of calf lymph under present conditions is the facility with which, notwithstanding the time required for glycerination or other treatment, the supply can be multiplied at relatively short notice to meet the most extensive epidemic. It has been provided by the Local Government Board to all public vaccinators since the beginning of 1899. In 1871–73 and up to the period when calf lymph came into general use, it was extraordinarily difficult to obtain material sufficient for emergency revaccination called for owing to the existence of small-pox. Everything depended on the number of infants presented weekly for vaccination, and they might very readily be utterly insufficient for the purpose. This was so in Kilmarnock in 1873. In these circumstances many persons requiring and desiring to be vaccinated might remain unprotected, and there would even be temptation to resort to lymph taken from the vesicles of revaccination, a source which has never been regarded as satisfactory. In addition to the facility with which the supply of calf lymph can be increased it is now regularly kept in cold storage to the extent of half a million tubes by the Local Government Board. In the act of vaccination aseptic precautions are used to a very much greater extent than half a century ago.

Dosage.

One difference between practice in England and in Scotland is that in the former country the Local Government Board's standard of four vesicles with a total area of not less than half an inch is much more generally observed than in Scotland, excepting at the few vaccination stations. Certain statistics submitted to the Royal Commission on Vaccination rather seemed to indicate that the duration of protection conferred by infantile vaccination in Scotland was less than in England, and the explanation is not far to seek.

As regards the duration of protection afforded by different doses—at one time a matter on which bacteriologists tended to be sceptical—it is worth noting that all modern work on other vaccines has shown the primary importance of fixing a dose of bacilli at a standard rate, and that differences in the bacterial dose of the "vaccine" are every day accepted without question as explaining the whole difference between protection by and complete failure of inoculations. Marson's famous statistics of the London Small-pox Hospital, supported as they were by Russell's striking diagram of Glasgow Hospital results, are consistent with modern bacteriology.

Vaccinal Condition of Population.

Besides what remains of systematic vaccination the present position with regard to the practice is, broadly speaking, that infantile vaccination and revaccination are resorted to in presence of small-pox.

Diminution in the vaccination of infants results in there being now a larger proportion of young adults who have not the protection against severity which vaccination in infancy would undoubtedly have given them, and have not the partial protection against attack which, in those well vaccinated in infancy, undoubtedly is maintained to a substantial degree in younger adult life. On the other hand, it has to be remembered that, in some places at least, the occurrence or threatening of small-pox has led to an amount of revaccination at different ages which in the mass is probably considerable, and that demobilization of the forces will add materially to the proportion of persons who have received protection in adult life. On the whole, however, one must regard the population as distinctly less protected than twenty years ago. Even at that time infantile vaccination was not, in the absence of revaccination, in any way a shield such as in normal times completely protected Germany. But it did interpose a very substantial—and in former years an indispensable—check on the spread of small-pox. If from this year onwards no vaccination whatever were done in this country, we should for many years have the benefit of protection hitherto obtained.

Infantile Vaccination and the Spread of Small-pox.

But in respect of infantile vaccination it is necessary to take notice of a contention which has been advanced as to the relationship of the practice to the spread of small-pox. The view in question was promulgated in 1893 by Dr. J. H. C. Dalton of Cambridge and has been adopted and developed by Dr. Killick Millard, Medical Officer of Health of Leicester,[4] with all his characteristic energy and ability. The subtitle of Dr. Millard's book is "An Appeal for Reconsideration," and no one can have a better claim than he to make such an appeal. He has absolute faith in the protective power of recent vaccination against small-pox in the individual and has demonstrated his faith unequivocally in his work at Leicester. He took his own vaccinated children into the small-pox hospital, and had them photographed beside cases of the disease, using the photographs afterwards for persuasion of contacts to accept vaccination.

Briefly, he urges that to the public at large infantile vaccination is on balance disadvantageous because it often makes subsequent small-pox so mild as to be unrecognizable, with consequent spread of infection by missed cases. Therefore, he holds, the present law of so-called compulsory vaccination should be repealed. A subordinate reason submitted for this proposal is that repeal would diminish the opposition with which the offer of emergency vaccination in presence of small-pox is often met. That consideration is sound for what it is worth, but its value must be a matter of individual opinion, and need not be discussed here.

On the main contention, however, I desire to offer some observations. Though the Vaccination Acts are called compulsory they are so only in name, especially in recent years, and Dr. Millard agrees on that point. But legislation is a political question, and if infantile vaccination is a public danger there is no logic in confining its discouragement to the omission of legislative pressure. The discouragement should be active and definite. This would mean advice to a parent to refrain from vaccinating his child, the adviser hoping that if unfortunately the child subsequently took small-pox it should have so severe an attack as to make the disease easily recognizable, with a view to its immediate isolation and the protection of the public. A considerable proportion of such attacks would of course be fatal. The proposition raises a question in medical ethics. It would surely be wrong to refrain from

protecting one individual against severe or fatal small-pox in order that other individuals, adults or children, should escape the result of omission, by themselves or by their parents, to secure a safety which is open to all. But apart from ethics the view seems to me unsound that infantile vaccination is, on balance, disadvantageous in relation to the prevalence of and mortality from small-pox.

It may at once be agreed that infantile vaccination, by mitigating small-pox where it has failed to prevent it entirely, makes the disease much milder, with the result that on any large basis of fact more cases will be missed than if the attacks had been of ordinary severity. Indeed, modification as well as prevention of small-pox is one of the virtues of vaccination. But there is another side to the shield. It is true that an eruption of, say, ten pustules will more readily be overlooked than an eruption of 100 or 1,000 pustules. But the quantity of inherent infectivity is correspondingly less. Other things being equal, it is only one-tenth in the one case and one-hundredth in the other. The amount of buccal eruption, so far as it is important, corresponds broadly to the amount of cutaneous eruption. When a medical officer reports that certain cases of small-pox were so mild as to be unrecognized, he naturally thinks of this as increasing his difficulties, and is apt to forget the considerations on the other side. Severe small-pox is not by any means always recognized in its early stages, and a single "missed" case, say, in a vagrant, among a score or a hundred discovered cases may make all the difference in the spread of infection. Also, failure to notify small-pox has not always been due to non-recognition of the disease. In Dr. Spencer Low's report on the Dewsbury epidemic of 1904, he says that "non-notification of cases" in many instances meant "concealment of cases." It is clear that a mild concealed case would be much less likely to spread infection than a severe, unvaccinated concealed case.

Experiences of Medical Officers.

The epidemic of 1892–95, and in the provinces the epidemic of 1902–5, have been so mild in character that, independently of vaccination, the difficulty of diagnosis has been naturally much greater than ever before. Consequently references to missed cases bulk largely in the reports of medical officers, and Dr. Millard is able to cite numerous instances. But easy diagnosis can be obtained at too great a cost, and a locality is much better with its mild cases, whether naturally or artificially mild, and its more difficult diagnosis, than it would be with severe cases easily diagnosed but with a high fatality rate and producing a large amount of infectious material, however carefully guarded. If a missed case is naturally mild it will tend to cause the disease in modified form; if it is artificially mild it will tend to revert to the natural type of epidemic. If that type itself be mild the difficulty of diagnosis will correspond. If, on the other hand, it be severe, then the desired facility of diagnosis will be obtained, but at the cost possibly of a heavy attack with disfigurement, or even death, as a frequent result.

Bristol.—Sometimes a mild case does cause a considerable spread of infection. Dr. Davies records that in Bristol, in January, 1912, an "ambulant" case set agoing a series of small outbreaks which extended over eight months—4 cases in January, 18 in February, 8 in March, 12 in April, 7 in May, 15 in June, 7 in July, and 4 in August. As no death from small-pox occurred in Bristol during 1912 the type of disease throughout must have been mild, independently of vaccination. In 1903, however, 15 introductions by sea and land were checked at 46 cases, and in his report for 1905 Dr. Davies records how one mild case wandered about with the eruption well out, visiting a public-house where there were many workmen. Great efforts were made, with the aid of the Local Government Board, to watch for secondary cases, but only one certain and one doubtful case occurred. The disease had been since 1903 "of an extremely mild or minimal type which is possibly not highly infectious except to intimate, or bed-contacts," and which even in the unvaccinated may give merely a nominal attack. It appeared to have been imported from North America, and if the type remained unchanged, would be of as little importance as chicken-pox.

Derby and Halifax.—Dr. Howarth, in Derby, had in 1903–4 a total of 255 cases with 5 deaths, and states that the mildness of type resulted in a number of cases being overlooked, and in addition instances of delayed notification were frequent. He goes on to remark that such cases add to the difficulties of repressing an epidemic, "but I must confess to some surprise at the fewness of cases which resulted from these causes," and he suggests that dissemination of infection may be less easy because of the vesicles forming hard cornified bodies, "and in addition the amount of infective material available for dispersion is probably directly proportionate to the amount of rash" (p. 29 of Report). Dr. Neech of Halifax, writing regarding a discrete case in his report of 1903, notes that the first batch of cases infected from it occurred amongst persons in the same workshop and in the same lodging-house. "No case at this time occurred among the general public, although he was moving freely among them."*

Dundee.—There was considerable prevalence of small-pox in Scotland in the years 1901–4 inclusive, in large centres of population, especially in the industrial belt which lies across the Lowlands from south-west to north-east. Within this belt the city of Dundee is a manufacturing and port town, with at that time about 163,000 inhabitants, with a good deal of poverty and slum population, and with thousands of married women working in the great jute mills, and leaving their children at home.

In Dundee in 1902 there were 57 notified cases of small-pox, with 4 deaths. In the course of his report Dr. Templeman, the medical officer, writes as follows:

> In a considerable proportion of the cases the source of infection could not be traced. In a few it was ascertained that the person had been in contact with some one who was believed to have had a mild attack of chicken-pox, and in others to have suffered from influenza. I think there can be no doubt that during the whole course of the outbreak mild cases of small-pox were occurring which were not notified, either from the person not having sought medical advice, or from the case being diagnosed as influenza from the fact that no rash was discovered, or as chicken-pox from the mild character of the symptoms.
>
> The only unrecognized case from which a considerable number of persons were infected was that of a man, 49 years of age, who had been suffering from an eruption for two or three weeks, but, as his general symptoms were trifling, the eruption was regarded as that of a common skin disease. Several of his fellow-workers had been visiting him during his illness, and two of them suffered from well marked small-pox, as did also his daughter (married) and his cousin, who resided in the country. It was rather a curious fact that although nine other persons resided in the house along with this man, none of them seem to have contracted the disease, except perhaps a lodger, who had a very slight illness, which, however, did not incapacitate him for work, and who had a few papules amongst his hair. One of his fellow-workmen afterwards contracted small-pox, and was probably infected by him.

In 1903, 36 cases were notified in Dundee. Dr. Templeman writes:

> In a considerable number of instances the source of infection could not be traced, though it was in several cases found that the patient had been in contact with supposed cases of influenza or chicken-pox, these having really been cases of modified small-pox.

Notwithstanding such mild and unrecognized cases of small-pox, the disease obtained no large hold in Dundee. Throughout the five years 1900–4 the number of notified cases was 175, with 12 deaths, or 6.9 per cent. The disease was therefore of a fairly mild type, and difficult to diagnose. But infantile vaccination had been well attended to. Deducting "insusceptibles" and deaths before the age for vaccination, the percentage of unvaccinated survivors at six months of age was only 4.7. Whether this town would have profited in respect either of deaths or attacks, if infantile vaccination had been successfully discouraged in order to make diagnosis easy, is a question which hardly seems to require an answer.

Sydney and Trinidad.—In the remarkably mild Sydney epidemic of 1913 Dr. Armstrong calls attention to the low intensity of infectivity, and records that—

> In the course of the epidemic twenty-seven country towns or districts of New South Wales were invaded by small-pox, and the total number of cases diagnosed in these localities only amounted to fifty-two. The greatest number of persons attacked in any one locality was six, and in sixteen localities only one person was attacked.

And of the Trinidad epidemic of 1903 Seheult says:

> The slow spread of the epidemic was due to the slight infectivity of the disease. In many cases the contagion or virus seemed to require intimate contact for its transmission from

* Dr. Neech is of opinion that the disease is only slightly infectious until after the pustules have dried up and formed scabs.

one person to another, and even then it was remarkable how frequently instances were found in which such contacts escaped infection. (*Proceedings*, Roy. Soc. Med., 1908, p. 236.)

Dunbartonshire and Stirlingshire.—My own experience of the risks of infection from small-pox so mild as to be hardly recognizable is that it is not very infectious. A case which greatly impressed me was that of a woman whose attack was discovered only through her having infected two persons within her own dwelling. She had been moving about freely in the town where she lived, shopping and meeting people on the streets. I feared an outbreak, but after hesitation it was decided to delay advertising a general offer of emergency vaccination, and to maintain vigilant watch for cases. Outside the woman's own dwelling not a single case occurred.

In my annual report for 1905 to the County Council of Stirlingshire I wrote as follows regarding a small-pox patient, Mrs. R. B., aged 35, of Stenhousemuir, the wife of a Carron Company's workman:

> Her case is interesting with regard to the source of infection. The medical attendant informed me that, after the beginning of the year, the husband had had a slight illness, which was regarded as influenza, but that connected with it there had been one or two spots on the scalp. I interviewed the husband, and found that his illness had begun in Stenhousemuir, and had continued while he was temporarily employed in Bradford, and that he observed the spots on his scalp merely because they gave him trouble in combing his hair. I communicated with the medical officer of Bradford, and learned that he had been investigating an outbreak of small-pox which had occurred on January 30th, which he suspected to be due to a Scotsman from Carron Company, who had taken lodgings on January 16th, and had felt poorly, and thought he was suffering from influenza, but had no medical attention. He returned from Bradford on the 23rd, and his wife sickened on February 7th, or fifteen days afterwards, so there is no doubt she got the disease from her husband. This case illustrated a frequent experience. The man's attack was exceptionally mild, and he infected no one outside the house in which he lived, though he was in contact with many people outside. Dr. Evans, the Medical Officer of Health for Bradford, informs me that amongst a list of twelve contacts there, of whom seven were outside and five in the house where the man lodged, only two were attacked, these being among the latter five, while all the seven outsiders escaped.

The above passage is from a report on 19 cases in January and February, 1905, in East Stirlingshire. In the infected houses there were twenty-one children under 10 years old, but, owing to infantile vaccination, not one of these was attacked by small-pox. If, owing to discouragement of infantile vaccination, any of these twenty-one had not been vaccinated and had developed a severe or fatal attack, I wonder what the parents would or would not have said had it been explained to them that vaccination had been deliberately omitted in order that an attack, if it occurred, might be so severe as to be recognized, in the hope of getting the case away to hospital in time to prevent infection of the neighbours' children.

Leicester.—Dr. Millard himself, in discussing the control of "contacts," divides them into two classes—"inside," living in the same house with the patient; and "outside," living elsewhere, but "who have been in the same room with the patient after he has taken ill." For outsiders, he thinks vaccination scarcely worth while, but exercises surveillance. This practice, it will be borne in mind, was based on the experience of small-pox of a remarkably mild type, with a low fatality rate, so that many of the cases would be difficult of recognition even amongst the unvaccinated.

London.—The London statistics of 1892–95 and 1901–2 are worth examining in relation to the question at issue.

The earlier epidemic was of a mild type with a fatality rate of 8 per cent. The proportion of cases "unaccounted for" in respect of infantile vaccination had in the decade 1881–90 ranged between 5.7 and 13.9 per cent., the mean of the rates being 8.5. Public health organization was improving, but was not so well advanced as in 1901–2. The later epidemic was of a severe type, with high fatality—16.8 per cent. Public health organization was better developed, and the omission of infantile vaccination had increased greatly, so that default ranged from 16.4 to 33 per cent., the mean of the rates being 24.05. London, in fact, had made measurable progress towards the ideal of cessation of infantile vaccination. In these circumstances, with a more severe disease more easily diagnosed, with less of the infantile vaccination which is complained of as making diagnosis difficult, and with administrative organization improved by a decade of additional experience, the disease in 1901–2 should, *caeteris paribus*, have been more effectively controlled than in 1892–95. But the facts were that in 1901–2 there occurred 9,659 cases, as compared with only 4,759 cases in 1892–95. London's huge population provides such a statistical basis as tends towards elimination of errors due to paucity of data, but even for London a careful survey of all relevant considerations would be necessary to justify actual conclusion, and so I content myself with calling attention to the facts set forth.

Another point to be noted is that, notwithstanding the superabundance of very mild small-pox in America and the constant traffic across the Atlantic (the journeys taking less than the incubation period), and the difficulty of diagnosis, no epidemic of the American type has been set up in this country since 1902–5.

Though in effect advocating the discouragement of infantile vaccination with a view to achieving such severity of attack as will make diagnosis easy, Dr. Millard himself aspires after mildness of type. "It is obviously," he says, "of the highest importance that the type of an epidemic should be kept as mild as possible."[5] This is more than a pious aspiration. It suggests action to influence the type of a current epidemic. It is "to be kept" as mild as possible. But by what human effort except vaccination can such mildness be secured in an epidemic? In the Gloucester epidemic, of a naturally severe type, would not previous systematic infantile vaccination have had the effect of keeping the epidemic mild, of making the disease less fatal, and of altogether preventing hundreds of the attacks which did occur? One cannot both discourage vaccination in order to make the disease diagnosable and encourage it in order to keep an epidemic mild.

In thinking of this question of missed cases there is risk of being misled by false analogy. Every one knows that mild unrecognized scarlet fever often baffles the medical officer in endeavouring to control an outbreak. But the mildness of scarlet fever and its infectivity do not run parallel as in small-pox. Failure to recognize scarlet fever by parents, with consequent failure to send for a doctor, depends mainly on the absence of the rash, whilst infection, it is now accepted, comes mainly from the throat and nasal passages. The throat may be much affected, whilst the skin has little or no eruption. Also, Dr. Mervyn Gordon, reporting to the Local Government Board, maintains that infectivity depends on one organism, but severity of attack on another. There may therefore be no difference in infectivity as between a mild and a severe case of scarlet fever.* Another false analogy relates to the old practice of small-pox inoculation. It is alleged that thereby the individual was protected but that the community was endangered, and more harm than good was done. That proposition is historically open to dispute, and the Royal Commission on Vaccination wisely held the decision in doubt. But accepting it for the moment, variolation did produce an infectious disease, whilst vaccination does not. It is true, of course, that with lapse of time after vaccination immunity diminishes. The remedy, however, is not to refrain from infantile vaccination, but to resort to revaccination.

In 1904 Dr. Millard made the following reservation: "It is possible that if practically the whole population become unvaccinated, the 'Leicester Method' will prove insufficient to keep the disease in check." This is a hard saying. If vaccination makes small-pox so difficult to diagnose as to do more harm than good, surely a wholly unvaccinated population would be best of all for resistance of invasion. If only 20 per cent. are unvaccinated then the other 80 per cent. may, through missed cases, spread disease among the 20; if 40 per cent. are unvaccinated, they are liable to infection from the vaccinated 60; if 80 per cent. are unvaccinated there is still a danger from the 20 vaccinated. The fact is there is no half-way nor quarter-way house. If infantile vaccination does more harm than good, then the less there is of it the better, and none at all is best of all. Since writing these words I find that Dr. Millard's views on the disadvantage of infantile vaccination have forced him to practically the same conclusion. "I honestly believe that if the entire population of Leicester were either completely vaccinated (by repeated

* Dr. Millard, however, referring to scarlet fever, asks, "Is it not probable that the great change which has taken place in the type of the disease, in the direction of lessened severity, has been accompanied by shortening in the duration of infectivity?" (*Trans. Epidem. Soc.*, 1901–2.)

vaccination) or completely unvaccinated the danger of small-pox would be less."[6]

Here it is necessary to bear in mind what would be the effect on the condition of the community, as a whole, of the discontinuance of infantile vaccination. Under exposure to small-pox the proportion of vaccinated persons infected is much less than of unvaccinated. The greater the total amount of vaccinal protection in a population the smaller is the number of persons liable to attack. For nine or ten years after infantile vaccination, especially if the prescribed standard of number and area of marks is adhered to, the individual enjoys a very large degree of immunity, not merely against death but against attack. In both respects the immunity continues, though in diminishing degree, for a much longer time than this, that against death being much more prolonged. The fatality rate of small-pox in childhood is exceptionally high. But it is childhood that is specially protected by infantile vaccination, and children allowed to remain unvaccinated in order that if attacked they might have an illness sufficiently severe to make diagnosis easy, would be more likely to have a fatal attack than if the disease were deferred to later years. This would be part of the price of easier diagnosis.

The object of vaccinal legislation is, of course, to promote vaccination. If it has no such effect then it is useless and ought to be given up, still more so if on balance it in some way or other tends to discourage vaccination. These are relevant considerations for the Legislature, which also has to take a broad view in relation to the whole doctrine of the liberty of the subject. But to discourage vaccination in order that the unvaccinated individual may have an easily diagnosable (therefore possibly fatal) attack of small-pox seems to me a proposition contrary alike to the principles of medical ethics and to the interests of the public health.

There is, however, one conceivable condition which would not only justify but demand the cessation of vaccination. If small-pox were to disappear, so also manifestly would the need for vaccination. The risks attaching to vaccination were never in this country more than trivial, and calf lymph with modern asepsis has made them imponderable in weighing the value of vaccination;* but if there were no need for vaccination it would have no value, and the marvellous decrease of small-pox since the close of the outbreak with which this century began makes such a possibility, however remote still, yet apparently less remote than ever before.

REFERENCES.
[1] *Med.-Chir. Trans.*, vol. xxxvi, p. 385. [2] Local Government Board Medical Officer's Report, p. 97. [3] BRITISH MEDICAL JOURNAL, November 24th, 1894. [4] *The Vaccination Question* (H. K. Lewis, 1914), and *Public Health*, February and March, 1917. [5] *Public Health*, 1904, p 620. [6] *Public Health*, March, 1917.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

THE DURATION OF GESTATION AND THE RECKONING OF THE AGE OF A HUMAN EMBRYO.

IN dealing with the questions of the duration of gestation and the reckoning of the age of a human embryo, we must bear clearly in mind (*a*) that no woman living and capable of living a marital life who has never menstruated, and who is incapable of menstruating, has ever or will ever become pregnant, and (*b*) that in ordinary circumstances menstruation is always held in abeyance during utero-gestation.

From time immemorial apparently it has been customary to reckon the duration of gestation and to estimate and fix the probable date of delivery from the time of occurrence of the last menstruation. It has been assumed, on no scientific grounds, that gestation in woman extends over a period of ten lunar months or 280 days, but strange to say, although fertilization cannot take place during menstruation, some authorities nevertheless consider that the 280 days should be calculated not from the cessation but from the time of appearance of the last menstrual discharge. Because, however, when an ovum is fertilized, gestation begins at a definite time the method of reckoning the probable date of parturition from the last menstrual period has met with a certain amount of success and satisfaction owing largely to the fact that a large percentage of women menstruate every twenty-four or twenty-eight days. In those cases in which menstruation is wont to recur every five or six weeks the present method of reckoning the probable date of delivery is apt to bring discredit upon medicine as a science. It is, moreover, generally conceded that fertilization may take place at any time during the intermenstrual resting period—the period, that is, extending from the cessation of menstruation to the two or possibly three days prior to an expected menstruation, when there is, in anticipation of the heightened oxidative processes necessary for the fulfilment of that function, an increased determination of blood to the internal organs of generation. I have[1] elsewhere drawn attention to the fact that we have the strongest clinical reasons for believing that no matter when the human ovum is fertilized gestation in every case begins during the two or possibly three days preceding an expected menstruation. Let us, however, assume that fertilization and the starting of gestation are to all intents and purposes synchronous, or rather that the beginning of gestation follows fertilization immediately, then it must be allowed that the gestation period for an ovum fertilized immediately after menstruation is longer than that for an ovum fertilized four or five days before an expected menstruation. In support of this contention we have no scientific or clinical fact. From what obtains in the matter of the germination of seeds and the incubation of birds' eggs, we are justified in concluding that even in the case of the fertilized human ovum fertilization and the beginning of gestation are not necessarily synchronous except where fertilization happens when the internal organs of generation are about to prepare for an anticipated menstruation.

Embryologists have hitherto adopted the aforesaid fallacious method of estimating the age of any given human embryo. Some are inclined to attach much importance to the probable date of fertilization, but from what I have already stated it must be evident that, even if we could rely upon the statements of women as to the occurrence of an alleged fruitful and possibly single act of coitus, the date of such would be of no service in estimating the probable age of a human embryo. It is quite clear that our present method of reckoning the duration of gestation is a tacit admission either that fertilization and the commencement of gestation are synchronous, and take place at a definite and fixed time in the case of every fecundated woman, or that, whilst fertilization may take place at any time during the intermenstrual resting period, gestation itself begins in all cases at a definite and fixed time. That the latter is the correct interpretation of all the clinical facts connected with the reproductive process in women I have no shadow of a doubt.

JAMES OLIVER, M.D., F.R.S.Edin.

COLLOSOL ARGENTUM IN A MENINGOCOCCUS CARRIER.

NURSE —— had been nursing a case of cerebro-spinal meningitis and became infected. Swabs taken at weekly intervals from the nasopharynx by Captain Assinder, Pathologist 2/1st Southern General Hospital, showed meningococcus on culture. The swabs continued to be positive each week from October 28th, 1918, to January 1st, 1919. The patient was isolated and subjected to various forms of treatment, including Levick steam inhalations, chloramine-T sprays, etc., but the meningococcus remained present. She became very melancholic and despondent owing to the segregation and the lack of success in exterminating the germ. She was referred to me for suggestions as regards any intranasal treatment, and as a last resource I suggested a spray of collosol argentum. From January 3rd this was applied four times daily for three minutes, in an all-glass spray, through both nostrils. At the expiration of the first week no meningococci were found in the test swab. The same result was obtained at the end of the second and third weeks, the

*The Royal Commission reported that the risks "though undoubtedly real and not inconsiderable in gross amount," still "when considered in relation to the extent of vaccination work done, they are insignificant." Since the Commission reported, the change from humanized to glycerinated calf lymph has been complete.

[1] *New York Medical Journal*, January 16th, 1917.

spray in the meantime being continued. The patient was very gratified at being released from isolation. She has now returned from a month's leave and a test swab taken by Captain Assinder was found to be negative. No collosol was sprayed into the nose during this period.

I have since prescribed collosol argentum in several selected cases of rhinitis. It has the effect of contracting and toning up the nasal mucous membrane and giving much sense of relief after it has been used for four or five days. Turgescence seems to disappear. Cases showing œdematous enlargement of the posterior ends of the middle and inferior turbinates without true hyperplasia are markedly benefited by its use. One or two cases complained of slight soreness of the throat after a day or two. Perhaps this is due to its astringent properties.

B. SEYMOUR JONES, Capt. R.A.M.C.(T.),
Aurist and Laryngologist, 1st and 2nd Southern General Hospitals.

Reports of Societies.

CAUSATION OF INDUSTRIAL ACCIDENTS.

AT a meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine on March 14th, the President, Lieut.-Colonel E. W. GOODALL, in the chair, Dr. H. M. VERNON read a paper on industrial accidents. Dr. Vernon gave a summary of the investigations described in his report[1] to the Health of Munition Workers Committee (Memorandum No. 21), demonstrating the connexion between the frequency of industrial accidents and (*a*) rate of output; (*b*) fatigue engendered by long hours; (*c*) external temperature. He also exhibited photographs of numerous safety devices and a chart showing the reduction of industrial accidents which resulted in America from a safety campaign. In the ensuing discussion, Dr. COLLIS referred to the importance of the subject and the evolution of the system of medical inspection of factories in relation to accident prevention. Captain GREENWOOD referred to the investigations made by himself, Mr. Udny Yule and Miss Woods, which threw light upon the personal factor in accident causation, and remarked that attention to the environmental factors studied by Dr. Vernon, together with elimination of susceptible workers, would go far to reduce accidents to a minimum.

THE DIAGNOSTIC VALUE OF THE WASSERMANN REACTION.

AT a pathological meeting of the Liverpool Medical Institution held on February 13th, with the President, Mr. THELWALL THOMAS in the chair, Major J. M. BEATTIE read a paper on the diagnostic value of the Wassermann reaction in syphilis. He claimed that the test, when carried out with a full and accurate technique, was of extreme value, and referred to the very consistent results obtained by three experienced workers selected at the instance of the Medical Research Committee.

The results in 1,000 cases were analysed, and it was shown that negative results could in almost every case be reconciled with the history of the cases, treatment, etc., and that in positive cases the clinical and serological diagnoses almost invariably agreed. In clinically obvious cases—for example, chancres, condylomata, gummata—every negative result could be satisfactorily explained by the cases being either very early, fully treated, or undergoing treatment at the time the test was done. In other cases, where dependence had to be placed on a very imperfect history, the agreement between clinical diagnosis and serological was not so close, but there was sufficient agreement to justify the opinion that the reaction was of the greatest value. Fallacies were dealt with, such as the development of thermostable anticomplementary substance produced by bacterial growth in the blood and the varying amount of complement absorbed by healthy blood. It was urged that further accuracy might be attained by estimating the amount of complement that could be absorbed by the blood without the presence of antigen before commencing the test proper. The importance of standardized antigen and amboceptor and the adoption of one standard method for all approved laboratories were urged.

[1] BRITISH MEDICAL JOURNAL, 1918, vol. i, p. 569.

Reviews.

WAR CRIPPLES.

PROFESSOR JULES AMAR, of the Conservatoire des Arts and Métiers in Paris, is well known for his investigations into muscular activities by means of ingeniously devised recording machines. His work on the physiology of industrial organization,[1] an example of a class of books in which the French excel—that of popular scientific treatises—has now been translated into English. It is somewhat difficult to criticize, because it deals with a surprising number of themes and may therefore be regarded from many points of view. It is not only a popular handbook on hygiene, but it deals with psychology, pedagogy, caligraphy, and oratory. In this last connexion we are told that "the psychical ego withdraws itself at intervals from the strain of thought, taking refuge by preference on some flower-strewn bank." After which we are not surprised to find that rhetoric is the subject of the next paragraph, though we are told that "the adornment of speech is a means, not an end." The apprenticeship system, the comparative value of the French and the Italian workman, the ethnography of Northern Africa, and especially of the Kabyles—"five Kabyles are equivalent to six good Arab workers"—their diet, the author's formula of a refreshing drink for them, and the right policy to be pursued in native education in Algeria; all these and more are dealt with.

It is interesting to learn that one of the first pioneers in the study of the economics of labour was the great military engineer Le Prestre de Vauban, some of whose fortifications, as at Verdun, have been the scenes of recent fighting. Lavoisier studied the effect of muscular effort on the amount of oxygen respired, and thus initiated one of the methods employed by Professor Amar; but it is to the American engineer F. W. Taylor and his successor Gilbreth that he turns for inspiration when inquiring into the circumstances most favourable to increased output of work with the least fatigue to the worker.

By recording apparatus attached to a file, to a joiner's plane and to a spade, and by the ergometric bicycle and the cheirograph, bulb dynamometer and arthrodynamometer, all of which are self-recording instruments and with all of which the consumption of oxygen is recorded, tracings and charts have been prepared of many cases. The results are of value as showing the amount and direction of the forces employed and their regularity or irregularity. The efforts of the patient can then be directed to correct defects, to ensure economy of effort, to note the onset of fatigue, and to regulate the spells of work accordingly.

Some of the conclusions reached after testing hundreds of workmen and soldiers are worth quoting. For instance, it was found that in walking on the level the most economical speed was 4.5 kilometres (2.8 miles) an hour with two minutes' rest at every kilometre. When a burden of about 45 lb. was carried the rate was lower—namely, 4.2 kilometres (2.6 miles). These speeds are considerably less than that of men marching at the quick step of the British army. The results with men carrying burdens upstairs or up an inclined plane also suggest modification of generally accepted views in the direction of decreasing speed and increasing the number of intervals of rest. In bicycling (on the level?) the most economical speed is one of nearly ten miles an hour, and at this rate the work done is half that in walking the same distance—a rather unexpected conclusion to most people, who would consider a twenty mile walk as far more tiring than a forty mile bicycle ride. A good deal, however, must depend on the condition of the bearings and tyres of the bicycle.

The last three chapters of the book are devoted to the consideration of re-education of war cripples, including the design and supply of artificial limbs. Professor Amar

[1] *The Physiology of Industrial Organization and the Re-employment of the Disabled.* By Professor Jules Amar, Director of the Laboratory of Physiological Research in the Conservatoire des Arts et Métiers, Paris. Translated by Bernard Miall, etc. London: The Library Press, Limited. 1918. (Roy. 8vo, pp. xxv+371; 135 figures. 30s. net.)

states that 80 per cent. of the war-crippled are capable after re-education of earning their living, but of this number nearly one-fifth will require special workshops and appliances. He considers that the method of investigation he used for normal persons is necessary for the study of the capabilities of cripples, and incidentally that it is capable of detecting malingering. The tracings reproduced are of interest as showing improvement under training. We do not think, however, that anything is to be gained by substituting his elaborate methods of examining and training amputation stumps for older and simpler methods, but his remarks on sensation in stumps are of interest. Scarcely enough importance is given to the value of length of stump in making the attachment of a prosthesis secure, apart from its value as a lever. To take the forearm as an instance: it is true that from the mechanical point of view of flexion of the elbow any portion of the bones below the attachment of the flexors is superfluous, but from the point of view of the prosthetic surgeon every inch is of importance, for security of attachment and comfortable distribution of pressure. The cardiograms taken from cases of recent amputation are of considerable interest as showing the lasting deleterious effect of severe wounds and sepsis, and they are in accordance with expectation. They may be compared with a statement of a distinguished surgeon that the subject of amputation has a better prospect of life than the man whose limbs are intact, which was seized upon and much quoted by the lay press.

The chapter on scientific prosthesis contains nothing that is not familiar to surgeons in this country. As regards artificial legs, the criticisms of the American types of limbs are contradictory, and we venture to think that some types of limbs produced here and by the Belgian Government and others are superior to those which Professor Amar dogmatically asserts are the best. The artificial arms described are of familar types. The "universal pliers" is a practical instrument, useful for many purposes.

In the last chapter, on professional re-education, the importance of restoring the patient to his old calling when possible, is emphasized, but the following list is given of occupations suitable for teaching in schools for war-cripples:

Orthopaedic mechanician, mechanical engineering (fitting, tool cutting), industrial design, photography, shoemaking, harness-making, saddlery, electrical fitting, tinsmith's work, management of agricultural machinery and small motors, wooden toy making, making hands and feet for prostheses, and carpentry.

The translator has used throughout the book the Continental spelling of prothesis and prothetic instead of the etymologically correct forms of prosthesis and prosthetic, used in this country.

MEDICAL FIELD SERVICE.

THE war just ended produced so many new conditions demanding fresh lines of treatment and throwing new responsibilities on the medical officers, that some simple textbook enunciating and defining these and showing the reason for many of the orders and instructions in force was needed. It is a matter for regret that Lieut.-Colonel PAGE'S *Medical Field Service Handbook*[2] could not have been published earlier, for it contains just what a young medical officer in the field needs to know. The problems with which he is faced are dealt with in a practical manner, for the author, with his experience both as a surgeon in a casualty clearing station and as a subordinate and a commanding officer in a field ambulance, has learned what the needs are and what can be done, in the varying circumstances of warfare. Part 1 deals with the great question of "wastage," and the common causes and how they can be combated are discussed. The essential duty of the regimental medical officer to prevent sickness and wastage, by attention to the hygiene, the bathing, the laundry and the cooking of his unit, is pointed out. A very large proportion of the sickness in the armies has been due to skin lesions and to trench fever, and both of these conditions can be enormously reduced in incidence, if not eliminated, by careful attention to the personal hygiene of the men and by efficient methods of overcoming infestation with vermin. The chapter on trench foot also contains much useful information which has for the first time been put together in readily available form. One cause of wastage—venereal disease—the author has not touched on; it should be included, for the medical officer should be in a position to educate his men on the matter. In Part 2 the treatment of wounds is discussed. Particular attention is paid to the details of work and the necessary arrangements at the dressing stations, and to the all-important prevention of shock by warmth and transfusion. The portable warming apparatus which can be extemporized from material in the field, and which was introduced by Colonel Page, as also his simple method for warming or delousing clothing and blankets, is described. The early treatment of the various main classes of wounds is dealt with, and we are glad to note that the importance of suturing the "sucking" chest wound as soon as possible is emphasized. The concluding chapter outlines the pathology and treatment of gassed cases. The *Handbook* can be confidently recommended to all medical officers with the army, for even now when hostilities have ceased it will be found to contain much valuable information.

The author of *The Whole Duty of the Regimental Medical Officer*[3] has apparently gained much of his experience elsewhere than in France, but owing to the style in which he writes this does very little to detract from the interest and value of what he has to say. He divides his subject into three parts—the duty of a medical officer to the state, to his unit, and to himself; and winds up with an appendix on camp inspection. The three parts necessarily overlap, but Captain WOOD manages to avoid repeating himself. In all three he assumes, without saying so, that the reader is well up in ordinary professional work; the main aim is to show him how to apply his knowledge to the best advantage. No one who studies this little book can remain in doubt as to the width, importance, and exacting character of a regimental medical officer's duties, and for this reason it will prove useful even when all armies have reverted to a peace footing.

A MANUAL OF HYGIENE.

IN the sixth edition of BERGEY'S *Principles of Hygiene*[4] the author endeavours to survey the whole field and to take note of the advances made in recent years, so as to provide a thoroughly up-to-date book for the student and practitioner of medicine. It is of interest to the English reader to have a work dealing with the subject from the American point of view, for, although the principles of the science are the same for all countries, yet in their practical application there are slight differences. We need only mention such questions as buildings and the regulations for their construction, heating, and ventilation, the methods of quarantine, etc., to illustrate how the temperament of a country affects the practice of hygiene. Dr. Bergey illustrates his subject by examples drawn not only from American but from European sources, and in footnotes references for his statements are cited. The chapter on vital causes of diseases is rather incomplete, and animal parasites have far more consideration than those of a vegetable nature. Dysentery might have been more fully treated, and the information might have been more exact; the student should not be led to confuse *Amoeba coli* with *Entamoeba dysenteriae*, and should be instructed as to the bacterial varieties of the disease. Throughout the book there is no reference whatever to venereal disease; perhaps American public opinion has not been educated sufficiently to allow this subject to be dealt with in a textbook of hygiene. Valuable suggestions for the sanitary control of public conveyances, street cars, and barbers' shops find a place in the chapter on disinfection. The printing and paper are excellent, but many of the illustrations, especially those of traps, steam disinfectors, etc.,

[2] *A Medical Field Service Handbook.* By Lieut.-Colonel C. Max Page, D.S.O., M.S., F.R.C.S. With Foreword by Major-General Sir George Makins, G.C.M.G., C.B. Oxford War Primers. London: Henry Frowde, and Hodder and Stoughton. (Fcap. 8vo, pp. xiv + 159; 8 figures. 6s. net.)

[3] *The Whole Duty of the Regimental Medical Officer.* By Captain P. Wood, R.A.M.C.(T.C.). London: Foster, Groom, and Co., Ltd. 1919. (Fcap. 8vo, pp. 78. 2s. 6d.)

[4] *The Principles of Hygiene.* A Practical Manual for Students, Physicians, and Health Officers. By D. H. Bergey, A.M., M.D., D.P.H., Assistant Professor of Hygiene and Bacteriology, University of Pennsylvania. Sixth edition. Philadelphia and London: W. B. Saunders Company. 1918. (Med. 8vo, pp. 543; 63 figures. 16s. net.)

are rather obsolete. Apart from these minor defects the author has succeeded in a difficult task, and one requiring considerable judgement, not only as to what should be included, but also as to what should be omitted.

TREATMENT OF LEPROSY.

DR. F. HALL,[5] Medical Superintendent of the Leper Asylum, Makogai, Fiji, has recently tried Heiser's method of giving chaulmoogra oil. He rightly protests against drawing conclusions from small numbers of cases, and expresses the belief that some recent reports of results obtained are much too optimistic in tone. His own observations are based upon some ninety cases; several had had the injections for as long as two and a half years. He concludes that nothing dramatic must be expected after a few injections, and unless patient and physician are determined to persevere for a very long time "cure" should not be expected, though there is little doubt that the treatment is of great help to the leper. With it he may confidently look forward to the disappearance of attacks of leprotic fever, or a great reduction in their frequency and to escaping the leprotic "reaction." Improvement in general health and energy may be expected, provided of course that there is no intercurrent disease to prevent it, and that his organs of elimination are not too damaged to allow improvement. Some return of tactile sensation and reduced liability to traumatic ulcerations and even arrest of the disease may be observed in a certain proportion of cases. Trophic ulcers do not heal under its influence, and should always be treated surgically by the free removal of underlying bone which is always affected. A vaccine prepared from an acid-fast phase of a streptothrix produced no amelioration of the symptoms in several cases; in others it provoked a violent reaction. Chaulmoogra treatment is not new; it was in vogue as long ago as 1900, and the results obtained then correspond very closely with those now described.

NOTES ON BOOKS.

THE French newspaper press, though it is more like the British than that of any other country, differs in some respects. It gives less space to foreign news than the leading English newspapers, and more to comment. This is true of the most important French newspapers, which are all published in Paris, whereas some of the best informed British newspapers are published out of London. But the main difference is that the most active members of the French Parliament are regular contributors to the newspapers under their own name. Not a few have begun life as journalists. M. Clemenceau is an instance; he is a doctor of medicine, and once practised in Paris, but he has been a working journalist for nearly fifty years, editing many papers, but always the enemy of sham and prejudice, ready, as during the Dreyfus case, to run any risk of loss of popularity to defend what he believed to be the truth. Not long ago, when his attacks upon the then French Government was bringing it down, M. Léon Daudet expressed the general opinion when he said, "Make him a Minister or court-martial him." Of the way in which the French daily press, which is much as to say the Paris daily press, worked during the war, and of the accomplished writers and publicists who helped to guide and maintain public opinion, some account is given in a book[6] M. A. de Chambure has just published. It describes the character of the newspapers, and gives sketches of the career and opinions of the chief writers; it is an interesting and very readable book.

[5] *Treatment of Leprosy.* By F. Hall, Medical Superintendent, Leper Asylum, Makogai. (Government of Fiji.)

[6] *Quelques Guides de l'Opinion en France pendant la Grande Guerre, 1914–1918.* Paris: Celin et Cie. (Cr. 8vo, pp. 252. 4 fr. 50.)

THE INDIAN SCIENCE CONGRESS.

THE Indian Science Congress met in Bombay from January 13th to 18th, under the presidency of Lieut.-Colonel Sir Leonard Rogers, F.R.S., I.M.S.

At the opening meeting, when the Governor of Bombay was in the chair, Sir Leonard Rogers delivered an address in which he dwelt on the importance of research to India, illustrating the matter by tracing the steps through which the modern treatment of cholera was evolved. The first step was the use of normal (isotonic) salt solutions; the result was not very striking, though the mortality fell from 59 per cent. to 51.9 per cent. In 1907, after reflecting on the physiological principle that a high salt content tended to retain fluid in the blood, he determined to double the former strength, injecting 1.2 per cent. of sodium chloride. The result was most satisfactory, the mortality being nearly halved. It was next found that in severe cases the amount of chlorides in the blood might be below the normal, in spite of the great concentration of the blood. It was ascertained that the loss of serum from the blood in a severe case might be very great; in mild cases not showing any serious collapse the loss was 35 per cent.; in severe cases recovering after the isotonic saline solutions the loss averaged 52 per cent., whereas in dying cases the percentage was 64 per cent. Using Lloyd Jones's method of estimating the specific gravity of the blood, it was possible quickly to ascertain the quantities of hypertonic saline required to restore the normal fluidity. By treatment on this principle the mortality was reduced to 32.6 per cent. It was, however, realized that more should be done. Deaths appeared to be due to a recurrence of the collapse owing to absorption of the toxins produced by the cholera bacillus in the intestine when the circulation was restored after the saline injections. When the bacilli broke up as they did in enormous numbers, the toxins were liberated. Bearing in mind that they were largely albumoses and other unstable albuminous bodies, experiments were made with various oxidizing agents, and it was found that *in vitro* several times a lethal dose of dead comma bacilli could be neutralized by a small quantity of permanganates. A trial of large doses of potassium permanganate in pill form by the mouth, as much as 100 grains sometimes being given in the course of several days, in addition to the hypertonic treatment, reduced the mortality of cholera during a year's use from 32.6 to 23.3 per cent. Deaths, however, still continued to occur under this treatment from failure of the renal function. Acting on a suggestion of Sellards in the Philippines, who suspected a diminution in the alkalinity of the blood, sodium bicarbonate was added to the saline solutions and a marked reduction in the death-rate from renal failure ensued. The final result was that the mortality of cholera was reduced from 59 per cent. to 19.1 per cent., and was in one series of 288 cases only 14.9 per cent.

The lesson to be learnt was, Sir Leonard Rogers said, the importance of combined clinical and pathological investigations. It was therefore unfortunate that, with a view of facilitating the preparation of the material for the Pasteur treatment of hydrophobia, the laboratories in India had been placed on remote hilltops. As experience at Rangoon showed, it was possible to carry out the treatment of hydrophobia and other bacteriological methods in the plains, with the help of a refrigerator, and, where necessary, a temperate room. It was a serious disadvantage to so many of the bacteriological or, as it should be called, medical research department, that they had to work divorced from large hospitals. This defect would partly be removed when the schools for tropical medicine in Calcutta and Bombay had been opened. He urged in addition that all the larger hospitals should have whole-time pathologists. Unfortunately the controlling service in India was still quite unaware of the value of scientific training and experience, and objected to the more highly educated members of scientific sciences, including the medical, receiving adequate pay, much less the princely salaries the Indian Civil Service obtained themselves. In concluding his address, he appealed for the public endowment of medical research. Bengal and Behar had given him seven lakhs for a tropical school of medicine, and of this half had been expended on the Carmichael Hospital for Tropical Diseases; commercial associations were contributing 60,000 rupees a year to support three additional workers, to investigate the diseases which affected the labour forces of the tea, jute, and mining industries. He made an appeal also for an Indian Rockefeller to come forward with a crore or two of rupees, backed by contributions from others, for the aid of genuine medical research all over India, independently of race or position, under the control of a governing body. The chairman and a majority of the members of this should be scientific experts.

The congress had four sections—agriculture and applied botany, medical research, physics, mathematics and geometry.

(To be continued.)

AFTER-WAR DEVELOPMENTS RELATING TO PUBLIC HEALTH.

A CONFERENCE on after-war developments relating to public health was held at the Royal Sanitary Institute on March 13th, 14th, and 15th, and was attended by delegates from 120 local authorities.

The Public Health Aspect of Tuberculosis.

In opening a discussion on the public health aspect of tuberculosis, Dr. N. D. BARDSWELL (Medical Adviser, London Insurance Committee) said that many patients when they first came under the observation of tuberculosis officers were beyond cure, and of the curable cases many declined treatment on the ground that to undertake it would be to deprive their families of sustenance. The incompletely cured consumptive was a disabled worker; he could not survive the stress of competition with normal labour. Nothing but very widespread social reform would remove or ease these factors. In the meantime he urged greater use by the authorities of the services of skilled tuberculosis officers and also a more liberal scale of sickness benefit. The soundness of the colony or settlement idea was incontestable; the question was how far it was practicable. He described the occupational system at the colony at Papworth, where some ex-soldiers were able to augment their pensions of 27s. 6d. a week by small earnings. It was most important that consumptives who had had the grit to enter a colony and learn a new trade should not be mulcted of their pensions. The idea of a factory for the employment and segregation of consumptives was not entirely a dream. For the last two years a sanatorium-factory had been run by a care committee in New York, and it was found that the wages earned by the employees more than balanced the sum which in previous years the society had paid away in relief and subsidies.

Public Health Propaganda and Social Work.

Sir MALCOLM MORRIS, who presided over a discussion on public health propaganda, spoke of the Ministry of Health as marking the commencement of a new era. The co-operation of the people had to be secured, not by bullying and officialism, but by education. Somehow it must be made fashionable to be healthy. Professor H. R. KENWOOD said that the most effective propaganda would be that which sought out the people, and he spoke of the value of pithy and telling addresses by experienced persons to select audiences, such as the workmen at a factory. Many of the health departments in American cities carried out a regular public health educational propaganda through the columns of the newspapers; some of the departments kept their own publicity official. He was of opinion that any such propaganda in this country should be directed from the Ministry of Health by a council of medical men and women, together with social workers and journalists.

Welfare Work in Factories.

Sir ARTHUR WHITELEGGE (late H.M. Chief Inspector of Factories) presided over a discussion on this subject. Of "welfare," for which he thought a more adequate term should be found, he had seen at the Home Office the tentative beginnings; the war had given it a great impetus, and the Act of 1915 enabled the Home Secretary to make direct "welfare" orders, many of which were now in force. Systematic research on this subject had been undertaken by a strong committee, with Professor Sherrington as chairman, and he looked forward to increasing progress and not retrogression in the post-war period. Dr. EDGAR L. COLLIS (Director, Welfare and Health, Ministry of Munitions) sketched the whole history of welfare work. He said that when the armistice was signed there were 1,000 persons engaged in supervising women and girls in factories, and 400 persons engaged in supervising boys. He dealt in detail with the important considerations which arose where married women were employed in factories. The dismissal of the expectant mother as soon as her condition was manifest was wrong from every point of view. It did not benefit the pregnancy, because miscarriages usually occurred in the earlier months before the condition was generally recognized; reasonably active exercise for the pregnant woman was beneficial rather than harmful; she required not less but more earnings at this period, and not less but more supervision, and to dismiss her made it less likely that she should be encouraged to regard her condition as normal and physiological. The Welfare and Health Section of the Ministry of Munitions advocated a different plan. As soon as the condition was known, a woman on heavy physical labour was transferred to light work, and employment on night shifts was given up. About the sixth or seventh month she was transferred to a dépôt where light sedentary work was done, and where the ordinary factory discipline was relaxed so far as time-keeping and regular attendance were concerned. Reasonable wages were paid, calculated by time and not by piece, so as to avoid rush of work, and food was given. Under such conditions the woman might continue earning wages right up to her confinement. When the month was over it was considered that if the mother desired to return to industry she should be permitted to do so, by way of the light employment dépôt, whither she could bring her baby. A nursery was set aside at the dépôt, and opportunities were given for breast-feeding.

Child Welfare Work.

The closing discussion of the conference was on child welfare work. It was presided over by Mrs. Lloyd George, and was opened by Dr. FLORA SHEPHERD, who dealt particularly with the need for co-ordination between hospitals, homes, and institutions dealing with the health of the child. In each borough there should be a sufficient number of ante-natal and infant welfare centres to deal with the whole population, and so distributed that no mother would have to bring her child a long distance. To each centre should be allocated one or two health visitors, each of them directly responsible to the medical officer of the centre and ultimately to the medical officer of the borough.

ROYAL MEDICAL BENEVOLENT FUND.

THE annual meeting of the Royal Medical Benevolent Fund was held on March 11th at 11, Chandos Street, London, when the President, Dr. SAMUEL WEST, was in the chair. The annual report, which was presented and adopted, showed that in spite of the anxieties of the war and the successful special appeal made for the War Emergency Fund, the position of the finances was satisfactory.

In the grant department the subscriptions and donations showed a decrease nearly as large as in 1917, the decrease being £42. Owing to special subscriptions at the dinner it had been possible to distribute £256 more than last year. In the annuity department the income was £4,332, an increase of £585, of which £310 was derived from legacies. The amount distributed (£3,188) was £47 more than in 1917. The Guild continued its good work and made satisfactory progress. Reference was made to the severe loss the committee had suffered during the year by the deaths of Dr. Leonard Guthrie and Mr. Guy Elliston. The assistance of the British Medical Association was recognized in placing its whole organization at the disposal of the Fund and enlisting the help of the Branch and Divisional secretaries. The result had been the addition of considerable sums to the Fund's resources. Thanks were given personally to the Editors of the *Lancet* and the BRITISH MEDICAL JOURNAL, and to Mr. W. E. Warne (the Acting Business Manager of the British Medical Association).

The *War Emergency Fund* amounted to £22,699, which included £683 outstanding. The expenses of collecting, chiefly in printing, postage, and secretarial assistance, had been 7 per cent.; this economy might be fairly referred to good management, but had been largely helped by the liberal support of the British Medical Association, which had used its organization to make the special appeal for the War Emergency Fund widely known. Applications were investigated by a special subcommittee of which Sir Alfred Pearce Gould was chairman. It had been able not only to make grants but to put the applicants into relation with various Government departments, thus enabling them to take advantage of the resources set apart for this purpose by the Government. As was to be expected, demobilization had increased the number of applications, and it was anticipated that many more would be received in the course of the year. The total needed was £30,000, of which another £7,000 was required.

Election of Officers.—President: Dr. Samuel West. *Treasurer:* Colonel Charters Symonds. *Honorary Secretary:* Dr. G. Newton Pitt. *Committee of Management* (the first six were elected to fill vacancies and the others additional members): Dr. G. E. Haslip, Dr. Wm. Collier, Sir Hugh Rigby, Dr. R. O. Moon, Mr. Charles Ryall, Dr. Arnold Chaplin, Dr. William Pasteur, Mr. Warren Low, Mr. Percy Sargent, Dr. C. W. Chapman, Mr. Raymond Johnson, and Mr. H. S. Souttar.

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SATURDAY, MARCH 22ND, 1919.

DEMOCRACY AND INCOHERENCE.

MANY have looked at the device of the French Republic without realizing that its motto, *Liberté, Egalité, Fraternité*, is a most complete definition of democracy. It was framed by the French Revolution, and has therefore, especially in this country, often been misunderstood. The word of fundamental importance is *égalité*. The French Revolution gave forth many odd opinions, but it did not affirm that all men were equally endowed and deserving of equal consideration in all respects; on the contrary, it declared that it was to men of talent careers were open. By the word *égalité* it meant essentially that every man had the same rights before the law. By *liberté* it meant that a man was free to gang his ain gate so long as he did not offend the rules made by the community to which he belonged, and that a democratic constitution must ensure that he has had his share in the making of the rules. By *fraternité* is to be understood something more than recognition that others of the same nation have equal rights. As Mr. Belloc has well put it, "the community cannot express authority unless it possesses corporate initiative: that is, unless the mass of its component units are able to combine for the purpose of a common expression, are conscious of a common will." The means of getting this common expression has always been the difficulty of democracy. In practice the only method hitherto employed has been the representative system, subject to various controls of greater or less stringency and efficiency. In theory the system fulfils the condition of *égalité*, but in practice it often falls short either because, as usually happens, it is badly contrived, or because the individual members of the community do not recognize the obligations to vote, or on both accounts. With the anthropomorphism out of which the most of mankind has not yet grown, they imagine a Person which they call the State or the Government, and to it they address their supplications, on it rest their hopes and fears, and on it vent their dissatisfaction. As M. Clemenceau has said, with his customary brevity and conciseness: "How great is the illusion which leads a man to believe that responsibility attaches to the Government alone. In a democracy the responsibility attaches to every citizen. The people are responsible for the parliamentary majority." We may go a little further with M. Clemenceau. Though an individualist, he gave currency to the use of the word *bloc* to express the fundamental democratic idea that the citizen, while he is under an obligation to endeavour to make his opinions prevail, is yet under a corresponding obligation, if he fails to convince the majority, to sink his personal aspirations in the common will. He may work to alter the decision; he may seek also to change an imperfect method of obtaining a decision, and as the methods of election to Parliament in France and in this country are faulty, he may indeed believe it to be his duty to do so. That the decision must be loyally accepted while it is in force even by those who believe it mistaken, is a hard saying, but in large matters of peace and war we all admit its truth. If we do not act on this principle we fall, in another of M. Clemenceau's biting phrases, on "incoherence." It is of this incoherence that the medical profession in this country is in peril.

The Medical Secretary of the British Medical Association has done well in the first part of his address published in the SUPPLEMENT this week to tell the profession some elementary truths about democratic ideals and methods; he uses more words than M. Clemenceau, but he means the same thing. The later part of his address was devoted to a consideration of the reasons given for discontent with the British Medical Association. As to the first allegation—that the Association is not active enough—we entirely agree that it can only be made by a person who has not taken the trouble to understand what it does. The other complaint—that its organization is defective because it is not registered as a trade union—has often been made in recent times, and during the last two or three years the propaganda of the Medico-Political Union (an organization of medical men registered under the Trade Union Acts) has increased the number of believers in this doctrine.

The matter was gone into fully, with legal assistance, by this JOURNAL in 1913. It was approached under the impression that the Trade Union Acts, in spite of their title—for it generally turns out that an Act does more or less than Parliament intended—would be found to apply to a medical union, and that the question for decision would be whether the sacrifice of members which the acceptance of trade unionism would unquestionably entail, ought to be faced to ensure greater safety and efficiency. The conclusion was therefore unexpected. It was, as stated in the JOURNAL of April 5th, 1913, that the strength of trade unionism lies not in forms or laws, or in any immunity from legal process, but in the union and solidarity it has bred, making it possible to obtain obedience and bring about a strike if necessary. No one has yet shown how the medical profession could use the strike weapon even if the majority were willing to use it. The matter has now been gone into again by the British Medical Association, with the assistance of lawyers specially conversant with trade union law. The upshot is given by Dr. Cox, and shows upon what a shaky foundation the Medico-Political Union has built up the façade it presents to the profession.

The advantages claimed for trade union organization of the medical profession seem now to be reduced to two: one is that the funds of a medical trade union would enjoy the protection offered by the Trade Disputes Act of 1906. The legal opinion, as we understand it, is that in the first place a medical man is not a workman, nor a master, within the meaning of the Act; and that if the Trade Disputes Act was nevertheless held to apply, the funds of the union would indeed be protected, but the action would lie against individuals, whether officials or ordinary members of the union. The lawyers express the opinion that little or no advantage would be derived from registration as a trade union in a case in which claims similar to those raised in the Coventry case were again raised. Incidentally they state that a trade union has not the benefit of limited liability which a registered company—the legal status of the British Medical Association—has. The other advantage a medical trade union is alleged to possess over a body constituted as is the British Medical Association is that it would be able to join the Labour Party; but apparently any voluntary medical

organization can join the Labour Party, if it so desires, under the category of "brain workers." The fact is that the doctrine that registration under the Trade Union Acts would increase the powers or immunities of a medical organization appears, so soon as it is carefully and impartially examined, to be a delusion. There are three possible ways of producing a combination of persons having a corporate existence in the eye of the law and enjoying a legal status: it may obtain a charter from the Crown, it may become registered under the Companies Acts (as the British Medical Association is), or under the Trade Union Acts. The whole point is whether there is greater protection by registration under the latter than under the former Acts, and, as we have said, we believe the answer must be in the negative. There is no magic in the term trade union. Here, as is customary in all matters, but especially in legal matters, everything depends on the definition of the meaning of the words used. It seems a pity that able and energetic members of the Medico-Political Union should waste their time pursuing a will-o'-the-wisp.

We may feel this all the more because, though a better statement of the aims and objects of a comprehensive medical association could not easily be framed than is contained in the Memorandum of the British Medical Association, it would be rash to assert that its constitution is free from imperfection. Each reorganization of the Association has been designed to make its constitution conform more closely to the true democratic ideal, and to adapt it to the increase in the number of its members. On the whole the story is one of steady progress, but the present constitution, however excellent the intentions of its framers, has certain defects, obvious to any one who takes the trouble to understand the essential principles of democratic organization.

In every body of ardent reformers there have always been doctrinaires who made more noise and thus exerted more influence than their numbers or the weight of their arguments warranted. Two defects which might easily have been avoided are to be observed in the present constitution of the Association. The idea of having small units possesses great advantages; that no one doubts. But the mistake was committed of making these small units constituencies for the election of representatives. The mistake may be excused, because a similar method is used for the election of the House of Commons, yielding results so glaringly false that no responsible statesman can be found any longer to defend it.

The other defect may be traced to the fact that certain active members of the Committee which drafted the new constitution of the Association were enamoured of the idea embodied in the word "delegate"—that is, a person who in an assembly is the mouthpiece of the words, not of the ideas, of his constituents. This proposal had to be dropped, but the underlying idea was embodied in the doctrine of the "instructed vote"—that a member, unless he attended a meeting at some appointed place in his Division on an appointed day at an appointed hour, should not have the right to vote in the choice of his representative, or have any other opportunity of expressing his opinion except by writing a letter to the JOURNAL, which is a work of supererogation having no constitutional force. Is there any man who knows anything about the history of the development of the parliamentary franchise in this country or anything of what it is to-day, who will pretend that it would be possible to apply such a system to the election of members of Parliament? Is it conceivable that a man should be deprived of the right to vote for his representative, the only definite point at which he shares in the government of his country, because he had not attended a stated meeting at which he was instructed by the candidates, or instructed them? It is true, as the Council recently pointed out, that this defect is mitigated by a rule which gives power to a constituency to make use of the postal vote. Many believe that in the best interests of the Association and the profession the alternative—the vote in person—ought no longer anywhere to be insisted on.

THE FOOD REQUIREMENTS OF MAN.

THE time when the prospect of actual famine seemed something more than a figure of speech to the inhabitants of this country is past. To millions of human beings in other lands semi-starvation is still a grim reality, while those who realize the delicacy of the mechanisms upon which the integrity of a social system depend cannot overlook the connexion between the food supply of an island state and the preservation of industrial peace. Still, to most readers, the Report on the Food Requirements of Man just issued by the Food (War) Committee of the Royal Society[1] will not make an appeal so urgent as would have been the case eighteen months ago. It is, however, a document of considerable interest and practical importance.

In the first part the Committee deals with the data respecting the energetic needs of man, illustrating the argument by the cases of industrial work studied by Becker and Hämäläinen. It is remarked that "the essential factor when dealing with dietetics and with the metabolic exchanges is not the mechanical value of the work done, but the amount of energy which must be set free in the body—that is, the amount of food or body substance which must be consumed in order to perform this amount of work. When we are dealing with questions of diet our measure of light work, moderate work, or heavy work, should therefore be, not kilogram-metres, but calories set free in the body, since on these depends the diet which must be assigned to the different classes of workers. Although sufficient data are still wanting to make a proper classification of the different kinds of work, it would not be an impossible task to carry out such a classification based on measurements of energy-expenditure by the body as measured by respiratory exchanges, whereas it would be practically impossible to effect such a classification on a basis of kilogram-metres of work." Such a classification is illustrated upon the material we have mentioned, but the Committee is careful to point out how inadequate this basis really is.

Precisely the same criticism is applicable to the remarks upon the influence of external temperature upon food requirements, respecting which the data are, if possible, still less complete. The energetic needs of children and adolescents are examined in the light of Dubois's work, it being again pointed out that estimates are to be accepted "with great reserve." Respecting the brain worker, the Committee observes that as a general rule "it may be concluded that the brain worker, although requiring only 2,200 to 2,600 calories, as against 3,300 required by the bodily worker, will have to spend more than the latter on his food, since, in order that he may work with full efficiency, his food must be light and digestible and must contain a relatively larger proportion of protein."

In the following section the consequences of a

[1] Report on the Food Requirements of Man and their Variations according to Age, Sex, Size, and Occupation. 1919. London: Harrison and Sons. Price 1s. 6d.

restricted food supply are briefly examined, the opinion being expressed that "the community could exist, and could carry out a fair amount of work with a diminution of food supplies to two-thirds of their present amounts. In this case, however, it would be necessary to supply a strong incentive to the performance of work, which might be either a voluntary spirit of patriotic devotion, or the application of force, as in the condition of complete subjection to military rule hitherto prevalent in Germany."

Another section of the report deals with the quality of the food. With respect to protein the general rule is laid down that the diet of the "average man" should not contain less than 70 to 80 grams of protein daily and that some of this should be of animal origin. The significance of meat in the diet is due to its high content of animal protein and fat. Such a diet is of advantage to those engaged in sedentary occupations in a cold or temperate climate since it enables them to maintain their body temperature without the necessity of bodily exercise, but is not specially advantageous to the manual worker and may be, when the work has to be performed under a high external temperature, definitely disadvantageous. In discussing the place of fat in the diet, it is pointed out that experience demonstrates a close relation between the assimilation of fat and the performance of bodily work, and the opinion is expressed that "where vigorous muscular effort has to be undertaken it is essential that the diet should contain not less than 25 per cent. of its energy in the form of fat."

In the concluding section, accessory substances, or "vitamines," are mentioned. The Committee remarks that "practically all fresh foods contain small traces of substances whose chemical nature has not been determined, but which are essential for the maintenance of health or for the production of growth. In their absence growth may cease, repair of wounds may be interrupted, or various diseases—such as scurvy, beri-beri, or pellagra—may be produced. A diet composed of preserved meats and dried vegetables infallibly leads in the course of a few months to disorders of nutrition. . . . The growth 'vitamine' is present in especially large quantity in the fats of milk. It is partly on this account that milk is of such vital importance for the nourishment of children. No child's diet can be considered satisfactory in which milk or milk fat is not present." The Committee, in concluding its report, states that it "shows how very inadequate is our present knowledge of the science of nutrition, and demonstrates the necessity of renewed investigations of almost every point discussed in it."

We do not mean to disparage the value of the Committee's labours when we say that the sentence just quoted expresses a conclusion to be drawn from nearly every page of the report itself. At the risk of appearing pessimistic, we must add that it is likely to remain true for a long time to come. Probably our knowledge of the science of human nutrition has now been carried almost as far as it can be by private enterprise; further progress needs the co-ordinated efforts of many minds. But such co-ordinated efforts can only be expected to produce slow progress along beaten tracks. Some unsolved problems — for instance, the cause of cancer—have a certain romantic attraction; there is nothing impossible or even improbable in the belief that some effort of genius may reveal the secret in a flash. But this is not the case with the subject of nutrition. We cannot, of course, presume to set bounds to the achievements of genius; there is room and to spare for essentially novel and important advances (as illustrated by the study of "vitamines"), but where knowledge is most conspicuously defective is with respect to quantitative details, the provision of which merely requires the painstaking application of well tried methods and can crown the investigator with no new laurels. Whether such a prospect as this is tempting to the young investigator eager for distinction, and how far it may be expected to receive the support of advocates who see in "research" a series of conquests and popular triumphs, are questions we shall not attempt to answer.

CONSULTATIVE COUNCILS.

WHEN we go to press the Standing Committee of the House of Commons has not reached Clause 4 of the Ministry of Health Bill, which authorizes the establishment by Order in Council of consultative councils for giving advice and assistance to the Ministry of Health. The proceedings of the first two days (the Committee is sitting morning and afternoon) are published at p. 353. Incidentally, we may say that it does not appear that much importance need be attached to the use of the term "consultative" instead of "advisory," for we observe that the President of the Local Government Board, in his speech introducing the bill, used the term "advisory." The bill, it should be observed, speaks of councils in the plural, and probably during the discussions in committee it will become known what consultative councils beyond the medical are contemplated. Dr. Addison's conception of the functions of a consultative council was expressed in his speech on the second reading, when he said that he was a whole-hearted believer in the plan of giving to a number of people interested in the problems an active or sufficiently active share in matters of policy, so that the Minister shall be kept in touch with progress and with the opinions of people outside in a very real and intimate fashion. The duties and manner of appointing a council are set forth in a draft Order in Council. This document proposes that a council shall consist of persons of both sexes having practical experience of the matter referred to it. It is to consist of not more than twenty persons. They will be appointed by the Minister, but this will not preclude bodies interested from suggesting suitable members to the Minister, and we have every confidence that Dr. Addison will be disposed to accept the recommendations. The draft order provides that the council should meet at least once a quarter; it will be authorized to report upon questions referred to it by the Minister and to propose to the Minister questions which should be referred to it. It will also have power to report to the Minister on any matter affecting or incidental to the health of the people which has not been the subject of reference to it. The term of office of members of the council will be three years, but they will be eligible for reappointment for another period of three years, making six in all. The council will elect its own chairman, but its secretary will be appointed by the Minister. Further, the council may for special purposes appoint subcommittees from its members, and any subcommittee may add to its numbers persons who are not members of the council; the action of the council in both these respects is subject to the approval of the Minister.

AN EXTENSION OF RABIES.

Two cases of rabies in dogs have been confirmed by the Board of Agriculture, the one near Newport, Monmouthshire, on March 13th, and the other at Cardiff, on March 14th. Two other very suspicious cases near Newport are under investigation. The Board has consequently made

SPECIAL CLINICAL MEETING, LONDON, 1919.

APRIL 8th, 9th, 10th, and 11th.

NOTIFICATION OF ATTENDANCE.

All Members of the Association who propose to attend the **Special Clinical Meeting** are earnestly requested to fill up and post this form as soon as possible.

Notices on matters of interest to those attending the Meeting will appear from time to time in the *Supplement* or the *Journal*.

Early intimation will greatly facilitate the arrangements for official entertainments as well as for private hospitality.

It is my intention to be present at the SPECIAL CLINICAL MEETING in LONDON and

Please write distinctly.

I expect to be accompanied by _____

Name _____

Address _____

I would like to attend the RECEPTION by the PRESIDENT at the GUILDHALL on April 8th.

" " " CONVERSAZIONE given by the ROYAL SOCIETY OF MEDICINE on April 9th.

For these Entertainments, to which ladies will be admitted, the accommodation is limited, and it may be necessary to ballot for tickets. Please indicate your order of preference and whether you will be accompanied by a lady.

DINNER.

A Dinner will be held at the CONNAUGHT ROOMS, GREAT QUEEN STREET, W.C. (near Lincoln's Inn Fields), on THURSDAY, APRIL 10th, at 7.30 p.m. Applications for tickets should be made at once to the Secretaries of the Special Clinical Meeting, British Medical Association, 429, Strand, W.C. 2. The price of the Dinner Ticket, 10s. 6d., should be remitted by Postal Order with the application. As the number of Tickets is limited early application should be made.

Please reserve a seat for me at the Dinner, for which I enclose a remittance of 10s. 6d.

Signature _____

[See next page

GENERAL ARRANGEMENTS.

THE programme for the special clinical and scientific meeting of the British Medical Association to be held in London from April 8th to 11th is subject to revision, but will not probably undergo any material change.

ACCOMMODATION.

The Sections will meet and the registration of members attending will be carried out at the Imperial College of Science and Technology, South Kensington, placed at the disposal of the Association for the purpose by Sir Alfred Keogh, G.C.B., M.D., the Rector. Hotel accommodation in London is difficult to obtain: many of the large hotels are still occupied by various Government departments, and the others are very full. It is expected that private hospitality will be offered by members living in London, but the extent to which such hospitality will be available has not at present been ascertained, though steps are being taken to do so. Meanwhile, those who intend to be present at the meeting are advised to secure rooms as early as possible; it may be necessary to pay a deposit.

POPULAR LECTURE.

A popular lecture, on the surgery of the war, will be given by Major-General Cuthbert Wallace, C.B., C.M.G., Surgeon to St. Thomas's Hospital; the chair will be taken by Sir John Goodwin, K.C.B., Director-General Army Medical Service.

ENTERTAINMENTS.

A reception arranged by the Metropolitan Counties Branch of the British Medical Association will be held at the Guildhall, London, kindly lent by the Lord Mayor, on the evening of Tuesday, April 8th. The guests will be received by Sir T. Clifford Allbutt, K.C.B., F.R.S., Regius Professor of Physic, University of Cambridge, President of the British Medical Association.

On Wednesday evening, April 9th, the Royal Society of Medicine will hold a reception at its house, 1, Wimpole Street, W.1. The guests will be received by Sir H. D. Rolleston, K.C.B., President of the Society.

On Thursday evening, April 10th, a dinner will take place at the Connaught Rooms (10s. 6d. without wine).

Ladies will be invited to these entertainments. Academic or evening dress or uniform can be worn at the receptions at the Guildhall and the Royal Society of Medicine. The number of invitations which can be issued is in each case limited, and early application should be made.

The President of the Royal College of Surgeons will hold a reception at the College, Lincoln's Inn Fields, on Wednesday, April 9th, from 4.30 to 6 p.m., when there will be an exhibition of Hunterian and Listerian relics, etc. Tea will be served at 4.30 p.m.

The President and officers of the Royal College of Physicians of London will receive members who would like to see the portraits and books at the College on Thursday, April 10th. Tea will be served at 4.30 p.m., and at 6 p.m. Sir H. D. Rolleston will give a Lumleian Lecture on cerebro-spinal fever in the Library.

GENERAL SECRETARIES.

The General Secretaries of the meeting are:

Mr. CUTHBERT WALLACE, C.B., C.M.G., F.R.C.S., 26, Upper Wimpole Street, W.1.

Dr. GORDON HOLMES, C.M.G., 101, Harley Street, W.1.

Mr. S. MAYNARD SMITH, C.B., F.R.C.S., 28, Wimpole Street, W.1.

The Chairman of the Programme Subcommittee is Colonel J. G. ADAMI, F.R.S., C.A.M.C., Pembroke House, 133, Oxford Street, W.1.

Communications regarding accommodation, entertainments, etc., should be addressed to the "General Secretaries of the Special Clinical Meeting," British Medical Association (Room 46A), 429, Strand, W.C.2.

Stamp.

The SECRETARIES,
Special Clinical Meeting,
British Medical Association,
429, Strand, London, W.C.2.

PROVISIONAL PROGRAMME.

SECTION OF MEDICINE.

DISCUSSIONS will be held as follows:

Wednesday, April 9th.—10 a.m. to 1 p.m.

War Neuroses.—Chairman: Sir DAVID FERRIER, M.D., F.R.S. Introducer: Lieut.-Colonel F. W. MOTT, F.R.S., R.A.M.C. A discussion will follow together with a cinematograph demonstration by Lieut.-Colonel A. F. Hurst, R.A.M.C., of illustrative cases.

Thursday, April 10th.—10 a.m. to 1 p.m.

Influenza.—(In conjunction with the Section of Preventive Medicine and Pathology, *q.v.*) Chairman: Colonel HAVEN EMERSON, Medical Corps, U.S.A. The subject will be treated under the following headings:

1. Clinical Aspects. Introduced by Major-General Sir WILMOT HERRINGHAM, C.B., A.M.S.
   (*a*) Short account of epidemics of 1918 in France. Contrast between clinical features of spring and autumn epidemics—for example, respiratory complications.
   (*b*) Epidemic in England. Contrasts and resemblances to above.
2. Epidemiology. Introduced by Captain M. GREENWOOD, R.A.M.C.
3. Etiology. Introduced by Major BOWMAN, C.A.M.C.

N.B.—The pathological aspects will be treated by means of demonstrations.

Friday, April 11th.—10 a.m. to 11.30 a.m.

Venereal Disease.—Chairman: Sir WILLIAM OSLER, Bt. The subject will be introduced by Brevet Colonel L. W. HARRISON, D.S.O., K.H.P., Lecturer in Venereal Diseases, Military Hospital, Rochester Row. A discussion will follow.

11.30 a.m. to 1 p.m.

Prognosis in Cardio-vascular Affections.—Chairman: Sir JAMES MACKENZIE, M.D., F.R.S. Introducer: Dr. THOMAS LEWIS, F.R.S. A discussion will follow.

DEMONSTRATIONS.

The following demonstrations have been arranged to begin at 2.30 p.m. on each day:

Wednesday, April 9th.

Neurological Cases. National Hospital for Paralysed and Epileptic, Queen Square.
Diseases of the Chest. Brompton Hospital.
Mine Gas Poisoning. Lieut.-Colonel D. Dale Logan, D.S.O., R.A.M.C.

Thursday, April 10th.

Newer Methods in Cardio-diagnosis. National Heart Hospital, Westmoreland Street, Marylebone.
Cases and Specimens illustrating Cardio-vascular Disease. Dr. Thomas Lewis, F.R.S., at University College Hospital.
Air Force Tests.
Drawings of Throat in various Acute Infectious Diseases. Dr. H. Drinkwater, at St. Thomas's Hospital.

Friday, April 11th.

Venereal Diseases. Colonel L. W. Harrison, D.S.O., Military Hospital, Rochester Row.
War Neuroses. Lieut.-Colonel F. W. Mott, F.R.S., Maudsley Clearing Hospital, Denmark Hill.

Secretary of Section.— Colonel R. J. MILLARD, C.M.G., D.D.M.S., A.A.M.C., 429, Strand, W.C.2.

SECTION OF SURGERY.

Discussions on the following subjects have been arranged to take place in the morning of the day indicated.

Wednesday, April 9th.

Gunshot Wounds of the Chest.—Chairman: Sir GEORGE MAKINS, G.C.M.G. Introducers: Colonel T. R. ELLIOTT, D.S.O., F.R.S., and Colonel G. E. GASK, C.M.G., D.S.O.

Thursday, April 10th.

Wound Shock.—Chairman: Sir ANTHONY BOWLBY, K.C.M.G. Introducers: Professor W. M. BAYLISS, F.R.S., and Dr. H. H. DALE, F.R.S.

Friday, April 11th.

A Review of Reconstructive Surgery.— Chairman: Sir ROBERT JONES, C.B. Introduced by Major R. C. ELMSLIE and Major W. R. BRISTOW, R.A.M.C.

DEMONSTRATIONS.

Wednesday, April 9th.

2.30 p.m.—On Orthopaedic Methods, etc.; at the Special Surgical Hospital, Shepherd's Bush.
3.30 p.m.—Specimens illustrating Wounds of Arteries; at the Royal College of Surgeons.

Thursday, April 10th.

2.15 p.m.—Cases of Plastic Surgery of the Face from the Queen's Hospital, Sidcup.
3.15 p.m.—Cinematograph Lecture illustrating the Organization of a Hospital for Limbless Cases, by Sir John Lynn-Thomas.
4 p.m.—Cinematograph Lecture on the Treatment of Fractured Femur, by Major Pearson, S.A.M.C. (All the above will be held at the Imperial College of Science, South Kensington.)
Specimens illustrating Fractures of the Skull; at the Royal College of Surgeons.

Friday, April 11th.

2.30 p.m.—On Orthopaedic Methods, etc.; at the Special Surgical Hospital, Shepherd's Bush.
Material at the Army Medical War Museum, 5, Avenue Studios, 76, Fulham Road, S.W.1, by Lieut.-Colonel F. S. Brereton, R.A.M.C.
Specimens illustrating Gunshot Wounds of the Abdomen; at the Royal College of Surgeons.

It is hoped that arrangements can be made to give, in addition, demonstrations of *x*-ray plates and apparatus, and also of specimens illustrating war injuries of the eye.

Secretaries of Section.—Mr. C. H. S. FRANKAU, D.S.O., F.R.C.S., 57A, Wimpole Street, W.1; Mr. C. MAX PAGE, D.S.O., F.R.C.S., 48, Welbeck Street, W.1.

SECTION OF PREVENTIVE MEDICINE AND PATHOLOGY.

Discussions have been arranged for the morning meetings on the following subjects:

Wednesday, April 9th.—10 a.m. to 1 p.m.

The Dysenteries: Bacillary and Amoebic.—Chairman: Colonel S. L. CUMMINS, A.M.S. Introducers: Colonel L. S. DUDGEON, C.M.G., A.M.S., and Professor W. YORKE.

Thursday, April 10th.—10 a.m. to 1 p.m.

Influenza.—(At a joint meeting with the Section of Medicine, *q.v.*)

Friday, April 11th.—10 a.m. to 12 (noon).

Malaria.—Chairman: Sir RONALD ROSS, K.C.B., F.R.S. Introduced by Lieut.-Colonel S. P. JAMES, I.M.S. A Demonstration on malaria and an exhibition of specimens, arranged by Sir Ronald Ross.

12 (noon) to 1 p.m.

A communication will be made on a "Filter-passing" Virus in certain diseases, with especial reference to Polyneuritis, Encephalitis, Trench Fever, Influenza, and Nephritis, by Major-General Sir JOHN ROSE BRADFORD, A.M.S., Captain E. F. BASHFORD, R.A.M.C., and Captain J. A. WILSON, R.A.M.C.

DEMONSTRATIONS.

Demonstrations have been arranged to take place in the afternoon, beginning at 2.30.

Wednesday, April 9th.—On Malaria by the London School of Tropical Medicine.
Thursday, April 10th.—On the Pathology of Dysentery; at St. Thomas's Hospital, Albert Embankment.
Friday, April 11th.—On the Anaërobic Bacteria which infect Wounds; and On the subject of Filter-passing Viruses in Influenza and other Diseases, and Rickettsia Bodies; at the Lister Institute of Preventive Medicine, Chelsea Gardens.

Secretaries of Section.—Dr. J. A. ARKWRIGHT, Lister Institute of Preventive Medicine, Chelsea Gardens, S.W.1; Major A. M. W. ELLIS, C.A.M.C., 429, Strand, W.C.2.

THE WAR COLLECTION AT THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

The collection of pathological specimens from the seat of war in France will be on view daily from 10 till 6 (on Saturday 10 till 1) at the Royal College of Surgeons, Lincoln's Inn Fields, W.C.2. It comprises a large and complete series of gunshot fractures of the bones; and another series, equally complete, of gunshot injuries of the different organs and soft structures, as well as specimens of disease incident to warfare, the effects of gassing, trench nephritis, gas gangrene, etc. The following demonstrations have been arranged. Each will occupy about one hour.

Wednesday.—2.30, Colonel J. G. Adami, C.A.M.C., for Major Rhea, C.A.M.C.: Bone Inflammation and Bone Repair. 3.30, Sir George Makins: Injuries of Arteries. 4.30, Reception—Hunterian and Listerian Relics.

Thursday.—3.30 to 4.30, Professor Arthur Keith, F.R.S.: Fractures of the Skull.

Friday.—3.30 to 4.30, Mr. C. S. Wallace, C.B.: Abdominal Injuries.

British Medical Association.

CLINICAL MEETING.

SPECIAL

EXHIBITION

AT THE

Imperial College of Science and Technology,

INSTITUTE ROAD, SOUTH KENSINGTON, S.W.,

On Wednesday, Thursday and Friday, April 9th to 11th, 1919.

(OPEN DAILY, 9 to 5.)

Surgical Instruments,

Electrical Appliances,

Drugs, Foods, etc.

Full particulars upon application to

THE MANAGER,

429, Strand, W.C. 2.

an order prohibiting the movement of dogs out of a large area round Newport and Cardiff, including the whole of Monmouthshire and portions of Glamorgan and Brecknock, and requiring all dogs in the area to be muzzled and kept under control. The order points out, further, that any person owning or having in his charge a dog in any part of Great Britain showing symptoms suspicious of rabies is required by law to report the fact immediately to the police. The first case of rabies in the outbreak in Devon and Cornwall appears to have been confirmed by the Board on September 7th, 1918, and in the following six months twenty-nine cases had been confirmed in Plymouth, six in other parts of Devon, and five in Cornwall. The President of the Board, however, stated on October 26th that he was satisfied that rabies had then been in existence in Devon and Cornwall for several months, probably since the end of May, 1918. Down to the end of February, 1919, the total number of cases of rabies confirmed was 118, and of these 94 had occurred in Devon and 24 in Cornwall, but it was then believed that the prevalence of the disease was decreasing. Twenty-one people who had been bitten (18 civilians, 2 soldiers, and 1 sailor) had undergone Pasteur treatment for hydrophobia. There is a strong impression that the disease was imported from France, possibly by aeroplane but quite as probably by sea. It is possible that it has now reached South Wales from Devon by the same means, as there is a certain amount of coasting trade from Newport and Cardiff to ports in Devon. It is not doubted that there is a considerable prevalence of rabies in France: the Académie de Médecine, on February 18th, adopted a set of resolutions calling the attention of the French legislature and other public authorities to the serious position brought about by the increase of rabies, and urging the impounding of all dogs not carrying an official metal tab showing that the dog tax had been paid for the year. The facts which moved the academy to act were briefly, that rabies had been steadily spreading throughout France since the beginning of the war, that after having disappeared from Paris for four years it reappeared in 1916, producing 411 cases in 1918 and 63 in January, 1919, and that after twelve years of complete immunity a number of cases of hydrophobia in man had occurred recently in the Department of the Seine, two of them in January, 1919.

TUBERCULOSIS GRANTS.

THE Civil Service Estimates show that the amount required in the year ending March 31st, 1920, for the payment of grants towards the cost of the extension of sanatorium benefit to the dependants of insured persons under the National Insurance Act, and of the treatment of tuberculosis generally, is £850,000, an increase of £180,000 on 1918–19. Provision is included in this estimate for the statutory grants under the National Insurance Act, and also for special grants towards the cost of schemes undertaken by local authorities for the treatment of tuberculosis generally. The grants will be administered in England, Scotland, and Ireland, by the Local Government Boards, and will be calculated on the basis of 50 per cent. of the net cost incurred upon the schemes by the Insurance Committee, after taking into account sums applicable out of funds under the Insurance Act and other receipts. "Inasmuch as in the case of Wales the income from investments of the National Memorial Association is applied for the purposes of schemes undertaken by that association on behalf of local authorities, the grant in the case of such schemes will consist of (i) one-half of the income from investments so applied, including interest calculated at 4 per cent. per annum on any of its capital funds applied by the Association towards the provision of sanatoria, etc., under approved schemes, and (ii) one-half of the net cost of the schemes after deducting the income from investments and the grant under (i) as well as other receipts."

THE CLINICAL MEETING OF THE BRITISH MEDICAL ASSOCIATION, APRIL 8–11.

IN the centre of the JOURNAL this week is published the programme of the special scientific and clinical meeting of the British Medical Association, to be held in London on April 8th, 9th, 10th, and 11th, together with a form upon which those who propose to be present are requested to intimate their intention. As already stated on several occasions the committee which is endeavouring to find accommodation for visitors to the meeting is encountering great difficulties owing to the fact that many of the large hotels in London are still occupied by various Government departments, and the others are very full. It is expected that private hospitality will be offered by members living in London, but its extent has not at present been ascertained, though steps are being taken to do so. Meanwhile Sir Arthur Stanley, Treasurer of St. Thomas's Hospital, has offered to place two wards recently occupied by military patients at the disposal of the Association for the accommodation of members who may be willing to take advantage of this offer. Breakfast will be served, and possibly dinner. In this way 60 beds will be provided, and Sir Arthur Stanley has promised, if the demand is sufficient, to place another ward of 30 beds at the disposal of the Association. He also intends to ascertain whether the British Red Cross Society can do anything in this direction at other places in London. It is important that any officers or others willing to take advantage of this kindly offer should communicate at once with the General Secretaries of the special clinical meeting, British Medical Association, 429, Strand, London, W.C.2.

MENTAL ABNORMALITY AND CRIME.

THE much debated problem of the appropriate treatment of offenders against the law whose conduct and appearance or frequent relapses furnish reasonable suspicion of mental abnormality, has recently been under the consideration of a committee appointed by the Birmingham justices. In its report many interesting recommendations are made as to procedure in such cases. The Prison Commissioners have promised to appoint at the Birmingham prison a whole-time medical officer skilled in mental cases, and the expert services of Dr. W. A. Potts have been secured as adviser to the Watch Committee. The committee recommends certain principles of procedure. The first is that the court of summary jurisdiction, on sufficient evidence, should direct a remand or adjournment for inquiry. The person may be either remanded in custody, without bail, to a special department of the prison under the observation of the prison medical officer, or remanded on bail if he voluntarily undertakes to submit himself for examination by the doctor to the court. The court would also have power to adjourn the summons on the understanding that the person charged will consult and confer with the court doctor in the interval of adjournment. The period for remand for the purposes of medical observation should not in the first instance exceed eight days, but might be extended if necessary for the completion of the doctor's report. It is next advised that at the conclusion of the remand or adjournment the case should be proceeded with in the light of the doctor's report. It is pointed out that as a rule fines are inappropriate in cases of delinquency in which mental abnormality can be traced. Imprisonment should only be imposed when the nature of the charge justifies it and the court is of opinion that a period of detention under medical supervision is the proper method of dealing with the case; in that event the person charged should be committed to that part of the prison set apart for the treatment of special cases. When mental deficiency is proved to have existed from birth, or from an early age, in a person charged with an offence for which he is liable to be imprisoned, the court would either order him to be detained

in an institution, or placed under guardianship, or direct a petition to be presented to the judicial authority under the Mental Deficiency Act, 1913. Probationary supervision for any period up to three years under the powers of the Probation of Offenders Act, carried out by one of the probation officers appointed for the purpose, is another novel expedient for dealing with certain weak-minded offenders. This will imply periodical examinations by the court doctor, submission to hospital or institution treatment when ordered by him, abstinence from intoxicating liquor, and, if necessary, residence in an institution or with a guardian selected specially for the particular case. It is satisfactory to find that the Birmingham magistrates, who were the first to establish children's courts, are now leading the way to a more extended and efficient system of probationary treatment, especially in the case of young offenders handicapped by mental or physical defect.

THE OLD MEDICAL FACULTY OF STRASBOURG.

STRASBOURG, the French spelling of which may be taken as an indication of the return to a former order of things, has been for centuries the seat of a famous medical school. In 1514, 1517, 1528, 1534, and 1533 a series of works on the medical sciences was printed there. The *Feldbuch der Wundartznei* of H. von Gersdorff, or Schylhaus, a burgess of Strasbourg, was published in 1517. In 1538 Jacob Sturm, the Stadtmeister, founded a Lutheran academy with a rector and eight professors, two of whom taught medicine, one dealing with theory, the other with practice. Within fifteen years of its foundation the academy had among its students three princes, twenty-four counts, and two hundred noblemen. In 1621 it was erected by the Emperor Ferdinand II into a university, and in that year it created two doctors. Their theses remind one of the controversies of the Strasbourg faculty about the stranger's nose recorded by Slawkenbergius as quoted in that veracious chronicle, *Tristram Shandy*. Andreas Schilling argued as to the truth of the common saying "New doctor, new graveyard," and Johannes Carolus debated the question whether a Christian physician may without offence to his conscience treat Jews, Turks, atheists, and enemies of their country. But the studies of Strasbourg were not confined to such futilities. Chairs of anatomy and botany were founded in 1652. From 1566 the bodies of executed criminals had been handed over for dissection and medicine was regularly taught. When the city was annexed by Louis XIV in 1681 the university retained its privileges, and under French rule the teaching of medical science continued to expand. In 1738 the professor of internal pathology was empowered to give practical teaching at the bedside, and thus a true medical clinic, which was the first after those of Leyden and Vienna, was instituted. Students were not only allowed to follow the visit, but themselves examined the patients and treated them under the direction of the master. Obstetric medicine was early studied, and the Strasbourg school became celebrated throughout Europe. In 1522 Eucharius Roesslin published a handbook of midwifery, which is one of the oldest works of the kind. In 1561 there appeared a similar treatise by Ryff. Two centuries later a school of obstetrics was established in the civil hospital of Strasbourg under the direction of J. J. Fries; it was intended primarily for the teaching of midwives, but male students were also admitted. Materia medica was diligently studied, and the botanical garden of the city was long one of the richest in Europe. The university was suppressed in 1792, but two years later "schools of health" were established at Paris, Montpellier, and Strasbourg. They were primarily intended for the training of "officers of health for the service of the hospitals, mainly those for the army and navy"; later they were authorized to educate civilian students. The Strasbourg school was reorganized in 1803, and erected into a faculty of the Imperial University in 1808. Among the teachers who made Strasbourg renowned as a school of anatomy was Lobstein, among whose pupils was Goethe, who had entered the university to study law. The poet's daintier sense could not tolerate the sights and smells of the dissecting room, but he followed the other medical courses in 1770 and 1771. It was the Strasbourg faculty that first established the public teaching of histology in France; the Paris chair was not founded till 1862. Küss, professor of physiology from 1846 to 1870, was the last Mayor of Strasbourg, in which capacity he displayed the finest qualities as a patriot in the Franco-Prussian war. Sédillot, who was professor for nearly thirty years, still ranks as an authority among surgeons, and Eugene Köberlé occupies an honourable place in the history of ovariotomy. Villemin, Laveran, Mathias-Duval, and Lacassagne are among the glories of the Strasbourg school. After the war of 1870 some of the old teachers remained at Strasbourg and founded an "Ecole Libre de Médecine," which from November, 1871, to October, 1872, offered to students the means of finishing their curriculum or working till the faculty of Nancy was opened. The "free school" conferred degrees on seventeen students; these were the last French doctors created by Strasbourg. One of the last theses presented was that of Hoeffel on the old faculty. On that essay is based to some extent a history contributed by M. Pierre Lereboullet to *Paris Médical* of January 4th, 1919, which is the principal source of this article.

ACRIFLAVINE IN THE TREATMENT OF GONORRHOEA.

THE value of acriflavine in the treatment of gonorrhoea is the subject of a recent paper by Davis and Harrell of the Urological Institute, Johns Hopkins Hospital.[1] They point out that acriflavine, being highly diffusible, will penetrate the mucosa of urethra and bladder; that it is antiseptic in urine in higher dilutions than any other diffusible dye studied; that it inhibits the development of the gonococcus in culture in a dilution of at least 1 in 300,000, and, as shown by Fleming, has a peculiar affinity for leucocytes. Urethral injections of concentrated acriflavine cause slight smarting, which persists for an hour or more, but patients previously treated with protargol—a far less powerful antiseptic—say that acriflavine is decidedly less irritating. The most satisfactory concentration is found to be 1 in 1,000; it is as efficient as more concentrated solutions. No complication has followed the use of a solution of this strength, and smarting is almost negligible. When the anterior urethra is affected, about 3 c.cm. of 1 in 1,000 solution is injected into that part of the urethra and retained for five minutes In cases with posterior infection, 15 to 30 c.cm. are injected through into the bladder and the urethra is distended. The fluid is retained in the urethra for five minutes and in the bladder till the next voiding. Injections should be given twice a day until all organisms have disappeared from the discharge, and then once a day until the patient is considered well. The authors found that organisms frequently disappeared from the discharge after a single injection and did not return. In the majority of cases they disappeared after two or three injections. In a few cases organisms reappeared, but continued treatment soon caused their disappearance. The discharge lessened, became thin and mucoid, and had usually disappeared by the fifth day. In cases of anterior and posterior urethritis the posterior infection usually improved before the anterior. Trigonal inflammation quickly subsided. That some acriflavine remained in the urethra for a considerable time is shown by the fact that the discharge at the end of twenty-four hours was of a brilliant yellow colour, and many of the leucocytes were well stained. The urine was definitely yellow and fluorescent even after thirty-six hours. Though in many cases the dye acted almost as a specific, occasionally it seemed without any effect whatever. The cause of

[1] *Journal of Urology*, vol. ii, 1918, p. 257.

this was not determined. The authors state that the average length of an attack of gonorrhoea under this treatment is distinctly less than with the usual methods.

OXFORD OPHTHALMOLOGICAL CONGRESS.

THE Oxford Ophthalmological Congress will assemble at Keble College, Oxford, on the evening of Wednesday, July 9th next, and the meeting will be held on Thursday, July 10th, and Friday, July 11th. The first day will be largely devoted to a discussion on "Preventive Ophthalmology," to be opened by Colonel J. Herbert Parsons, A.M.S., consulting ophthalmic surgeon to the forces. Members intending to take part in the discussion are requested to give early notice to the honorary secretary, Mr. Bernard Cridland, Salisbury House, Wolverhampton. The second day will be given up to papers, demonstrations, and cases. It is hoped that members will make every effort to contribute to the success of the meeting with cases, specimens, new operations, or novelties of any kind. The annual general meeting will be held in the evening of Thursday, July 10th.

INFLUENZA.

IN the week ending March 15th the death-rate from influenza declined still further, the provisional figures for the ninety-six great towns being 2,305 (previous week 3,218). The London deaths declined to 435 (597 in the previous week). Only two English towns showed a substantial increase over the previous week's returns—namely, Birmingham with 157 deaths as compared with 134 in the previous week, and Oldham, where the deaths increased from 18 to 33.

SIR WILLIAM PETERSEN, who has been Principal of McGill University, Montreal, since 1895, is laid aside by illness, and the Council of the University has appealed to Sir Auckland Geddes, who until the outbreak of war was Professor of Anatomy in the University, to accept the Principalship. The *Daily Express* of March 20th stated that he intends to do so.

Medical Notes in Parliament.

Ministry of Health Bill.

STANDING COMMITTEE.

THE first sitting of the Standing Committee to which the Ministry of Health Bill has been committed by the House of Commons was held on March 13th, under the chairmanship of Sir Archibald Williamson. Dr. Addison (President of the Local Government Board) attended during part of the meeting, though still suffering from the effects of his recent illness. Major Astor, Parliamentary Secretary to the Local Government Board, and Sir Kingsley Wood also represented this Department.

It was agreed, as reported in the BRITISH MEDICAL JOURNAL of March 15th, that the Committee should sit on Tuesdays and Thursdays from 11 to 1, and from 4 p.m. to 6 p.m. in the evening, subject to any change that might be deemed advisable.

CLAUSE 2. GENERAL POWERS AND DUTIES OF MINISTER IN RELATION TO HEALTH.

A short discussion was raised by Major McMicking, who thought that the powers should be more closely defined. Major Astor agreed to insert words which disposed of any apprehension that the Minister would have powers at large.

The Committee then dealt with several amendments designed to enlarge the duties specifically conferred on the Ministry. Mr. Jersom Steward moved to include the notification of venereal disease. Dr. Addison said that the Local Government Board already had power to make such notification compulsory; fuller use should be made of the powers now possessed, but nothing, he said, would be gained by the insertion of the amendment. It was withdrawn. Captain Barnett withdrew an amendment to insert the words "to spread information about diet and hygiene," after Major Astor had explained that this work was already being done by the Local Government Board.

Sir Philip Magnus raised a question as to the meaning of the words at the end of the clause: "and the training of persons engaged in health services." He asked that they should be struck out as they might be taken to signify that the Ministry of Health could interfere with the training for the medical profession. Major Astor gave assurance that there was no such intention, but only that the Minister should keep in touch with other bodies dealing with health matters. The phrase was amended to read "for the training of persons for health purposes," and was then agreed to.

Major Hills moved to add as a qualification to the clause: "Provided that nothing in this section shall compel any person to receive treatment who makes a statutory declaration that upon conscientious grounds he objects to medical treatment." His point was that no Act of Parliament could compel a form of treatment unless persons were willing to accept it. Dr. Addison said that the clause would deprive the department of elementary rights already possessed, which should not be taken away, as they were needed for many kinds of infectious diseases. The amendment was defeated by 33 votes to 14, and the clause was passed in the following form:

> It shall be the duty of the Minister in the exercise and performance of any powers and duties transferred to him by or in pursuance of this Act to take all such steps as may be desirable to secure the effective carrying out and co-ordination of measures conducive to the health of the people, including measures for the prevention and cure of diseases, the treatment of physical and mental defects, the collection and preparation of information and statistics relating thereto, and the training of persons for health purposes.

CLAUSE 3. TRANSFER OF POWERS.

On Clause 3 (transfer of powers and duties to and from the Minister), Mr. Leslie Scott moved to add the transfer of "all the powers and duties of the Secretary of State under the Lunacy Acts, 1890 to 1911, and the Mental Deficiency Act, 1913." Major Astor explained that under the bill a Privy Council Order could be made for the transfer of "all or any" of the powers named, and adds that it was undesirable to require a complete transfer, as some of them affected the liberty of the subject. The amendment was withdrawn.

Poor Law.

The next discussion was on an amendment by Sir Alfred Warren for the immediate transference of the administration of the Poor Law to the Home Office. Sir Kingsley Wood, for the Government, gave assurances of its sympathy with the proposal to separate Poor Law administration from the work of the Health Ministry. The medical services of the Poor Law were, however, so entangled with the other health services that it would be impossible to separate them except in the course of time. If the amendment were carried the operation of the bill would have to be postponed. Sir Alfred Warren thereupon withdrew his demand.

Medical Research.

The principal debate of the afternoon arose on an amendment by Sir Philip Magnus for the transfer to the Ministry of the duties hitherto performed by the Medical Research Committee. Sir Philip thought it important that the Ministry should have under its own control a research department to which it could refer problems as they arose. Sir Kingsley Wood reminded the Committee that, inasmuch as it had been decided to have a separate bill for Scotland, any complete transfer was obviously impossible. Major Farquharson said that it would be unwise to take too limited a view of the functions of the Medical Research Committee; it would, he thought, have a wider scientific horizon if it were placed within the jurisdiction of the Privy Council than if it were attached to the Ministry of Health. At the same time the members of the House of Commons Medical Committee, of which he was secretary, desired that the Ministry of Health should have its own investigating department. Sir William Whitla expressed similar opinions, and Major Astor said that the Local Government Board already had powers for research, and exercised them. It was an error to assume, because transfer of the work of the Medical Research Committee was not included in the provisions of the bill, therefore medical research was excluded from the operations of the Ministry of Health. It was exceedingly desirable that there should be a body able to maintain research on a broad scale, unlimited by areas, and that the Ministry of Health should also be able to make any investigation if thought fit. He agreed that at a later stage words should be inserted in the bill to make plain that the Ministry of Health had power for "the initiation

and direction of research." This was the phrase which Sir Watson Cheyne had suggested should be introduced in Clause 2, but on the advice of Dr. Addison the matter was not taken up at that point. Sir Philip Magnus said that as the bill originally stood there was no ground for the assumption that such a reservation was made for the Ministry of Health, but after the satisfactory statement by Major Astor he would withdraw his amendment.

Medical Inspection of School Children.

A large part of the second sitting of the committee, which took place on March 18th, was occupied by the discussion of an amendment by Mr. Godfrey Locker-Lampson, which was eventually adopted without a division, in spite of the opposition of the President of the Local Government Board and the Minister of Education. The bill (Clause 3) provided for the immediate transfer to the Minister of "all the powers of the Board of Education with respect to attending to the health of expectant mothers and nursing mothers, and of children who have not attained the age of 5 years and are not in attendance at schools recognized by the Board of Education." The second part of the clause authorized the transfer at some subsequent date, by Order in Council, of "all or any of the powers and duties of the Board of Education with respect to the medical inspection and treatment of children and young persons." The amendment was to transfer these powers at once.

The discussion had been started near the close of the sitting on March 13th, and Mr. Fisher, the first speaker on March 17th, stated the Government objections to the amendment. It would, he thought, be very difficult and inconvenient, both from the point of view of health and of education, if school medical services were cut out of the educational machinery and transferred to the Ministry of Health. On the other hand, it would be equally injurious if the school medical services were not under the suzerainty and direction of the Ministry of Health, and if it were not reinforced by the weight of the authority properly belonging to that Ministry. In every Education Committee there was a section mainly interested in the schools from the physical side, and it would be regrettable if the interests of education and of the physical side of training were separated. For the purposes of unity he attached importance to the fact that Sir George Newman was Chief Medical Officer of the Board of Education, and was to be Chief Medical Officer of the Ministry of Health.

Mr. Locker-Lampson said that it was important that children between 5 and 15 or 16 years of age should come under the care of the Ministry of Health. In the matter of teeth the Board of Education had done very little. Mr. T. Thomson thought that the difficulties foresbadowed, although they might be great at the central departments, were largely imaginary as regards the local authorities. As matters stood, more regard was likely to be paid to attendances than to health. The conflict of interests was against the interest of health. Sir George Newman in his report had spoken of the slowness and laxity of the education authorities. Sir Samuel Hoare submitted that it would be better for education to make the transfer, thus freeing the education rates from health charges.

Sir Philip Magnus urged that the arguments used by Mr. Fisher went to the root of the bill. The object of the measure was to take over health services from the various offices of state, to consolidate them, and prevent them from overlapping. He saw no reason why physical training should not remain part of the work of the education authorities. The amendment asked only for the transfer of the duties of medical inspection and treatment of children. As for the proposal that the transfer should be subject to future decision by Order in Council, his view was that such transfer was either right or wrong, and should be determined now. Sir Ryland Adkins spoke in the same sense.

Dr. Addison reminded the Committee that there were two categories of services enumerated in the bill—those to be transferred forthwith, and others, all or any of which it should be lawful to transfer hereafter. He asked the Committee not to burden the Ministry at once with all these functions. Some services could not be transferred without great difficulty. For instance, how could physical training be divorced from medical inspection? Some of the health considerations must, he thought, be left to the people concerned with the life of the schools.

Mr. T. Simm, speaking as a representative of a colliery district, said there was need that the bill should be fully clothed. There should be one authority, and not two doctors attending to the same subject in different periods of the twenty-four hours. Sir Watson Cheyne confessed to much disappointment at the speech of Mr. Fisher. Nothing was said in Mr. Locker-Lampson's amendment as to time. Its point was not that the transfer should be made at once with inconvenience, but that the transfer should definitely be amongst the provisions of the bill. With regard to what had been said about physical training, he was disposed to take a different view from some other speakers. He was not quite sure that he would trust the schoolmaster to decide as to physical training. He had known cases in which boys had been expected to resume it when not fully recovered from operations.

Mr. Fisher asked the Committee to appreciate that the medical services had been one of the most successful branches of Education Board administration. Under the Education Act of 1918 special stress was laid on physical education. The Board encouraged the appointment of organizers of physical training, and a direct grant was to be made in aid. The type of men they were hoping to get were men who had some knowledge of anatomy. He thought this was a case for "leaving well alone," but, to meet the Committee, he was willing to propose that the transfer should be "subject to any exceptions which might be made by Order in Council."

Dr. Addison, replying to criticisms, said that the reason the bill was framed in its present form was that it was considered to be the most practical and business-like proposal that could be made. If the amendment were carried it would be his duty to review the situation between now and the report stage, and, if necessary, to move on the report stage the insertion of words to meet difficulties which he feared might be involved.

The amendment was then put, and, an overwhelming majority declaring for it, a division was not taken.

Midwives.

Major Hills moved to omit from the powers to be transferred immediately those of the Privy Council under the Midwives Acts of 1902 and 1918, his fear being that the rights of appeal to the High Court would be thus abrogated.

Major Astor, for the Government, gave assurance that this would not be the case. Parliament had given to the local authorities the direction, employment, and payment of midwives. The Ministry of Health succeeding the Local Government Board would be more qualified to deal with these local authorities than the Privy Council.

Major Hills withdrew his amendment.

Factory Inspection and Industrial Diseases.

Sir Philip Magnus then proposed the transfer to the Ministry of Public Health of the powers and duties of the Home Office relating to public health, including the sanitary condition of factories and the investigation and prevention of industrial diseases. He thought that the investigation of diseases incidental to factory work might be undertaken by the Medical Research Committee, which he hoped would be in operation under the Ministry of Health.

Lord Henry Cavendish-Bentinck thought that the supervision of the health of the adolescent worker was as important as the responsibility for the health of the children, and should be undertaken by the Ministry.

Mr. T. Griffiths urged that it was undesirable to overload the Ministry of Health. Dr. Addison said it was clearly the duty of the Ministry of Health to take cognizance of industrial conditions, but the proper authority ultimately to take responsibility for industrial conditions would be the Ministry of Employment, which would be developed from the Ministry of Labour. Otherwise the Ministry of Health would get involved in controversies as to hours of working, conditions of employment, and so forth. Sir Philip Magnus, on the explanation, withdrew his amendment.

Pensions.

The bill proposed that the transfer of the duties of the Minister of Pensions with respect to the health of disabled officers and men after they have left the Service, should be made subsequently by Order in Council. Sir Watson Cheyne suggested that the transfer should take place at once.

Dr. Addison said that at present it was impossible to disentangle pensions from medical treatment. He would favourably consider on a later clause whether an amendment with a time limit could be introduced. Sir Watson Cheyne expressed himself as satisfied.

Defective Children.

On an amendment to transfer to the Ministry the powers of the Board of Education with respect to mentally defective and physically defective children, Mr. Fisher pointed out that the amendment passed on the motion of Mr. Godfrey Locker-Lampson gave power to deal with these children. It was difficult to define where the frontiers of

education ended and the frontiers of health began. He suggested that the matter should be left over to the report stage to enable him to confer with Dr. Addison, and this was agreed to.

Lunacy and Mental Deficiency.

The words in the bill with reference to the transfer of the powers of the Home Secretary as to lunacy and mental deficiency were replaced, on the motion of Major Astor, by the words "enactments relating to lunacy and mental deficiency."

The Committee adjourned until March 20th.

The Release of Doctors and Nurses.—In reply to Major Molson and to Lieut.-Colonel Weigall, Mr. Churchill, on March 18th, said he was informed that the delay in the more rapid demobilization of medical officers was in the main due to the fact that since the armistice military hospitals had had to deal with large numbers of repatriated prisoners of war, the greatly increased number of enemy prisoners, and with hospital population which was transferred to military hospitals both at home and abroad on the closing of auxiliary American hospitals and those belonging to the Dominions. It was also stated that the large number of civilian medical practitioners released by the closing of the other hospitals mentioned was not included in any returns of the numbers demobilized. He did not consider these reasons sufficient to explain the proportion of doctors and soldiers demobilized respectively. He had therefore given directions for a prompt and more general demobilization of medical officers. The Minister of National Service had agreed that the restricted procedure of selection of individuals for release should be discontinued. There had not been much time for the fruits of this measure to become apparent, but the rate of release, both of doctors and nurses, had greatly increased in the past week. About 700 doctors had been released.

Cerebro-spinal Fever at Cambridge.—In answer to Sir Clement Kinloch-Cooke, Dr. Macnamara, on March 18th, said there had been an outbreak of cerebro-spinal fever among the young naval officers at Cambridge. Naval officers went to Cambridge on January 31st. On February 5th there were 60 cases among them of influenza, of whom 54 were treated at one ward in No. 1 Eastern General Hospital. These were all making a good recovery until February 13th and 14th, when 8 developed cerebro-spinal fever. There was then no cerebro-spinal fever in Cambridge, and the disease was apparently contracted from a "carrier." Two other cases developed cerebro-spinal fever; and the infection of one was traced to a previous case; the other was contracted outside Cambridge. Of the 10 cases 5 had died. All the cases had been isolated and nursed in the Military Hospital at Cambridge. The Medical Research Committee had supplied the special serum used in the treatment. The epidemic was considered to be well in hand.

Salvarsan and "Substitutes."—Mr. Pratt, on March 18th, stated for the Local Government Board that the remedies approved by it as substitutes for salvarsan were manufactured under licences issued by the Board of Trade allowing the manufacturers to employ the processes protected by patents used in the manufacture of the original salvarsan. The presumption, therefore, was that the drugs produced by these manufacturers were similar to the original article. Before being placed on sale, all the approved substitutes were tested on behalf of the Medical Research Committee. The Salvarsan Committee would shortly issue a report. In reply to a further question, Mr. Pratt stated that a special committee was appointed in 1918 by the Medical Research Committee to consider, among other matters, the value of salvarsan and risks attending its use. The Committee comprised representatives of the medical departments of the Admiralty and War Office, of the Medical Research Committee, and of the Local Government Board. The Board had circulated a memorandum by the Salvarsan Committee in which a definite opinion as to the value of salvarsan was expressed.

Gratuities for Dental Officers.—Mr. Churchill, on March 13th, said that a gratuity of £50 for each year or part of a year had been approved for army dental surgeons.

Farm Colonies for Shell Shock Cases.—Sir L. Worthington-Evans, replying to Sir M. Barlow, said that arrangements for the treatment of shell shock cases on farm colonies were being made. At present disabled soldiers suffering from shell shock were admitted to military neurological hospitals, where in nearly every case land was available and was utilized for this treatment.

Training of Defective Children: Latest Statistics.—Mr. Fisher informed Mr. Sugden, on March 10th, that accommodation at special schools was at present provided for about 15,000 mentally defective children and for about 5,500 cripples. No reliable figures were available as to the additional accommodation required, but new provision might be needed for about 15,000 mentally defective, and at least as many cripples. In considering schemes submitted under the Education Act the Board would have regard, amongst other things, to the adequacy of the provision proposed to be made for these types of children. As from April 1st grants would be payable to local education authorities at the rate of one half of their net expenditure on schools for these children. These grants would represent a substantial increase over those at present generally payable. Mr. Fisher also said he would consider any suggestion for seeking the aid of trade unions to continue the training of mentally and physically defective children when they left special schools, so that they might enter industries after a proper apprenticeship.

THE WAR.

CASUALTIES IN THE MEDICAL SERVICES.

ROYAL NAVY.

Died on Service.

SURGEON LIEUTENANT D. L. LEWIS, R.N.

Surgeon Lieutenant David Llewellyn Lewis, R.N., died at Inverness on March 2nd, aged 29. He was educated at the London Hospital, and took the diplomas of M.R.C.S. and L.R.C.P.Lond. in 1914, after which he acted as assistant medical officer of Bethnal Green Infirmary. He took a temporary commission as lieutenant in the R.A.M.C. on August 13th, 1914, a few days after the war began, but subsequently resigned, and joined the navy.

ARMY.

Died on Service.

CAPTAIN H. C. R. CHONDBURY, I.M.S.

Captain H. C. R. Chondbury, I.M.S., was reported as having died on service, in the casualty list published on March 13th. He received a temporary commission as lieutenant in the I.M.S. on August 25th, 1915, and was promoted to captain after a year's service.

DEATHS OF SONS OF MEDICAL MEN.

Godding, Frank C., son of Surgeon-General Godding, C.B., R.N., died at Brisbane on February 27th of disease contracted on active service at Anzac, in Gallipoli.

Owen, Norman Howell, Captain 5th Battalion Rifle Brigade, third son of Dr. J. Morgan Owen, J.P., of Fishguard, South Wales, died of pneumonia at the Military Hospital, Sheerness, on March 1st, aged 30.

Parsons, Guy Fowell, Lieutenant Commander R.N., of H.M.S. *Nigella*, sixth son of Dr. Charles Parsons of Tunbridge Wells, late of Dover, and Treasurer of the British Medical Association, 1896-98, died at Portsmouth on March 6th.

Payne, Thomas Algernon, Warrant Telegraphist, Royal Naval Reserve, third son of Dr. A. A. Payne of Sheffield, died of pneumonia in London on February 28th, aged 27. Before the war he was in the service of the Marconi Company, and joined the navy as a wireless operator on August 4th, 1914. He served at first on H.M.S. *Bacchante* in the North Sea, then on H.M.S. *Branwen* and H.M.S. *Montague* round the Scottish coast. He subsequently went to German East Africa on H.M.S. *Princess*, and lastly served in H.M.S. *Macedonia* in the Atlantic. He was demobilized on February 20th, just a week before his death.

HONOURS.

COMMENDED FOR SERVICES.

THE following are among the names brought to the notice of the Secretary of State for War for valuable services rendered on the occasion of the sinking or damage by enemy action of hospital ships, transports, and store ships, and for valuable services rendered on hospital ships:

Lieut.-Colonel (temporary Colonel) R. S. H. Fuhr, C.M.G., D.S.O., R.A.M.C.

Lieut.-Colonels: I. B. Emerson, R.A.M.C.(R.P.), P. B. Haig, I.M.S., C. W. S. Magrath, R.A.M.C., C. Milne, I.M.S., E. W. Sibery, R.A.M.C.

Majors: A. Bird, R.A.M.C.(T.F.), F. C. Whitmore, R.A.M.C. (T.F.).

Captain (acting Major) H. F. Everett, R.A.M.C.(T.F.).

Temporary Majors: W. G. K. Barnes, R.A.M.C. (formerly Deputy Surgeon-General R.N.), J. A. Devine, D.S.O., R.A.M.C., T. M. Kendall, R.A.M.C., R. Wilson, R.A.M.C., S. W. Woollett, R.A.M.C.

Temporary Captain (acting Lieut.-Colonel) G. W. Milne, R.A.M.C.

Temporary Captains: D. J. Jones, R.A.M.C., H. T. L. Roberts, R.A.M.C., W. V. Robinson, R.A.M.C., W. G. Silvester, R.A.M.C., A. G. Southcombe, R.A.M.C., W. H. Stott, R.A.M.C., T. D. Webster, R.A.M.C.

C.I.E.

The Companionship of the Order of the Indian Empire has been conferred upon the following medical officers in recognition of services in, or in connexion with, the military operations in Mesopotamia:

Lieut.-Colonel Philip F. Chapman, I.M.S.

Majors and Brevet Lieut.-Colonels: Henry J. Crossley, R.A.M.C.; James D. Graham, I.M.S.; William H. Hamilton, D.S.O., I.M.S.

Major (temporary Lieut.-Colonel) Cuthbert A. Sprawson, I.M.S.

D.S.C.

The Distinguished Service Cross has been conferred upon Surgeon Sublieutenant Arthur A. Osman, R.N.V.R., for services with the destroyers of the Grand Fleet flotillas between July 1st and November 11th, 1918.

FOREIGN DECORATIONS.

Further lists of decorations and medals awarded by the Allied Powers to the British forces for distinguished services during the course of the campaign have been issued. The following medical officers have received the decorations indicated:

Conferred by the President of the French Republic.

Légion d'Honneur—Croix de Chevalier: Lieut.-Colonel (temporary Colonel) Harold Collinson, C.M.G., D.S.O., R.A.M.C. (T.F.), Major (temporary Lieut.-Colonel) David Rorie, D.S.O., R.A.M.C.(T.F.), Captain (acting Major) James M. Smith, M.C., R.A.M.C.(T.F.).

Croix de Guerre.—Colonel Arthur E. Snell, C.M.G., D.S.O., C.A.M.C.

Conferred by the King of Italy.

Order of the Crown of Italy—Officer: Lieut.-Colonels Robert W. Knox, D.S.O., I.M.S., John Kyffin, R.A.M.C.(T.F.).

Croce di Guerra.—Temporary Captain Thomas W. Mason, R.A.M.C.(T.F.).

Conferred by the King of Rumania.

Order of the Star of Rumania.—Surgeon Vice-Admiral Sir William H. Norman, K.C.B., Director-General Medical Department, R.N.

Order of the Crown of Rumania.—Officer: Surgeon Lieutenant Commander Gilbert B. Scott, D.S.O., R.N. *Chevalier:* Surgeon Lieutenant William L. Glegg, D.S.C., R.N.

Conferred by the King of the Belgians.

Order of the Crown of Belgium.—Commander: Surgeon Vice-Admiral Sir W. H. Norman, K.C.B., Surgeon-General J. J. Dennis, C.B., R.N. *Officer:* Surgeon Commander J. O'Hea, R.N.

THE ARMY OF THE RHINE.

THE Secretary of the War Office has announced the cavalry regiments and infantry battalions comprised in the Army of the Rhine, together with the total numbers of all units and formations, including those on the lines of communication. The medical units are as follows:

3 cavalry field ambulances	10 casualty clearing stations
30 field ambulances	2 mobile *x*-ray units
11 sanitary sections	2 mobile dental units
2 " "	5 stationary hospitals (400 beds in each)
6 motor ambulance convoys	
1 mobile bacteriological laboratory	10 general hospitals (1,040 beds in each)
1 mobile hygiene laboratory	8 sanitary squads
2 advanced dépôts of medical stores	2 base dépôts of medical stores.

South Australia.

(From our Special Correspondent.)

MEDICO-POLITICAL.

THE State Parliament had a short session in 1918, during which two matters of interest were discussed. The Hon. John Lewis, M.L.C., sought to make cremation compulsory, but, as is not surprising, his motion was lost. The Hon. J. H. Cooke secured the appointment of a Select Committee to investigate the condition of the city cemetery. This was a convenient opportunity for taking evidence in favour of cremation, with compulsion in cases of cancer, of phthisis, and of infectious diseases generally. The efforts of these intelligent laymen may not bear immediate fruit, but will be of a high educative value. The cemetery witnesses, quite unnecessarily as I think, divulged some gruesome evidence, that showed that the skeletons of deceased aboriginal monarchs are still valued for anthropological purposes, and that the professional methods of Mr. Jerry Cruncher are not wholly extinct.

THE FEDERAL COMMITTEE OF THE BRITISH MEDICAL ASSOCIATION.

The Committee at its next session will have many matters of importance to discuss. One will be the project of a benevolent fund for the benefit of medical officers and their dependants who have in consequence of the war suffered in mind, body, or estate. The aim is to raise a capital amount of £75,000. No evidence has yet been adduced as to the absolute necessity for such a fund, which is, of course, designed to supplement federal pensions and the State funds already in existence for the same purpose, but, should the evidence be forthcoming, those who for various reasons have been unable to serve will be very ready to subscribe and help to make it a success. Subscriptions are to be sought only from the medical profession.

The matter of the "nationalization" of the profession is also much in the air, and in some of the States measures may be brought forward at any moment, so that it has been thought well for us rather to anticipate the introduction of any such measures, and to meet them, not in a spirit of opposition, but of constructive assistance. In relation to this matter a very able paper has been written by Dr. Hone (*Medical Journal of Australia*, November 30th, 1918), who lays stress on the advantages that should accrue if the Federal Government were to inaugurate schemes for research and the establishment of laboratories in country centres possibly in connexion with infectious hospitals. Dr. Hone would like, too, to see a wider scope given to those who deal with the prevention of disease.

THE MEDICAL SCHOOL.

It has been announced that Sir Edward Stirling and Dr. Watson wish to be relieved of their offices as professors of physiology and anatomy respectively at the end of the year 1919. Both gentlemen are about 70 years of age and both have served the university for a third of a century or more; both will be greatly missed. Whether the University Council will fill the vacancies by the appointment of Australians, or whether the salaries offered will be a sufficient inducement for first class men at home to apply, I cannot say, but the opportunity for reorganization of the medical school is one of which the council should take advantage.

THE SOUTH AUSTRALIAN BRANCH.

There is little to say of the Branch. Dr. J. C. Verco was re-elected president. The influx of returning members now that peace is in sight will give a great stimulus to the work, both scientific and administrative.

THE LUNATIC ASYLUM.

The city coroner some three months ago began to hold an inquest on every case of death at the Mental Hospital: he threatened to commit the overworked solitary resident medical officer (there are 1,000 patients), found all sorts of real or imaginary illegal detentions, and attracted the attention and the condemnation of Parliament and the press. A special committee appointed to investigate matters has just issued its report, showing that there were no real abuses—merely an inadequate staff, obsolete appliances, and insufficient accommodation for attendants.

Ireland.

HOURS AND PAY OF HOSPITAL NURSES.

AN agitation is being started in Dublin to improve the conditions for nurses, specially as regards their pay and hours of work. A pamphlet calling attention to the subject has been printed and widely circulated. A good deal of what is said in it is true, but some of the statements are exaggerated. For instance, it is stated that the hospital nurse has an eighty-three hour week, on another page mention is made of a nurse's fourteen hour day, and it is said that on Sunday she must work just as hard as on other days. This is certainly not true of the majority of Dublin hospitals, and it seems a pity that a good cause should be marred by exaggerations. A most reasonable complaint is that the remuneration of a trained nurse is too small. The salaries paid to staff nurses and sisters in the Dublin general hospitals vary from £28 to £50 a year, the average probably being between £35 and £40. Another complaint is that after nurses have paid an entrance fee and trained in a hospital for two or three years, they are forced to work on the private staff for another couple of years, earning money for the hospital before they receive their certificate. The whole matter is being seriously considered by the boards of the general hospitals, but they are all heavily in debt. The Governors of Dr. Steevens's Hospital at their last meeting decided that the number of hours a nurse remained on duty in the wards should be reduced, that the salaries of probationers, staff nurses, and sisters should be substantially increased, that the entrance fee should be

abolished, and that nurses should not be bound to the service of the hospital after obtaining their certificate of three years' training. The president of the Irish Nurses' Association has written to the press admitting that nurses are overworked and underpaid, but states that before they can be better paid or their hours of labour shortened, the hospitals must either close a proportion of their beds, or get more money. A public meeting of the Irish Nurses' Association is to be held, at which proposals will be submitted for improving the conditions under which nurses at present work.

Correspondence.

SECRETARIATS.

SIR,—It is long since I have troubled you with correspondence. Since you took to censoring my letters, I have been loth to burden a depleted war-time staff with the task of extracting from my letters any little spice of pepper or ginger that may have inadvertently found its way into them. In the words of the Psalmist, "I held my tongue, and spake nothing: I kept silence, yea, even from good words; but it was pain and grief to me." But I cannot refrain from endorsing Lieut.-Colonel Henry Smith's letter on the Germanization of the medical profession. Over the office door of every typical official might be inscribed the words of the poet:

LEAVE ME, LEAVE ME TO REPOSE.

If he had possessed energy, initiative, and courage to fight for his own hand, he would not have chosen the path of life that leads to the summit of ambition in the snug berth, followed by the pension; and his greatest bugbear is the man who wants to innovate. As Lieut.-Colonel Smith points out, the dull man surrounds himself with duller men than himself. He cannot endure the silent reproach that he sees in the exertions of the energetic and capable. Whatever energy he has is concentrated upon the effort to elude responsibility; the path trodden smooth by the feet of his predecessors is the path of ease and safety, and nothing will induce him to swerve from it.

In my early days I was myself told in plain terms when applying for a subordinate post, "No, I am not going to have under me an abler man than myself." I respected and admired the official's candour, and we subsequently became fast friends; but though he was undoubtedly right from his point of view in the individual case, and saved himself from much discomfort and me from losing a good friend, the principle is wrong.

Later in life I was one of a committee that was to appoint a man to an important post. The qualifications of one candidate, his record, and his achievements, were indisputably superior to all the rest, but a whisper went round that he did not get on with his colleagues; and after this he was among the "also ran."

If every dull man chooses duller men for subordinates, and these, when they attain promotion, choose duller still for their staff, what unfathomable depths of dullness will not be reached at last! If I may trust my own observation, the danger is not imaginary.

Give the official a form to fill up, a return to make, a schedule to compile, a document to minute, and he is a happy man, and looks forward to the time when he shall have reached such a position of authority that he can devise new forms for his subordinates to fill, new returns for them to make, new schedules to compile, new kinds of documents to minute.

We are told that in a certain Eastern country the doctor who follows orthodox practice is safe, whatever the fate of his patient. He who innovates is left alone if his patient recovers, but if the patient dies the doctor is immediately put to death. I do not say that a Government Department is always or necessarily opposed to innovations. It is not. When an innovation is so thoroughly proved to be beneficial that it is universally adopted, the Government Department concerned will approve of it and recommend it, and will show that the improvement is due to its own fostering care. It meets the inventor and discoverer with a fair offer. It says, "You take the trouble, you spend the money, you take the risk, and we will take the credit. As long as you are struggling with your difficulties we will thwart and obstruct you in every possible way. When your discovery is successful we will belittle it and sneer at it until it is established beyond the possibility of cavil. Then we will take all the credit for it, and you can go hang!"

This is the oft-repeated history of the action of Government Departments towards discoverers and inventors; and, as we see in Germany, Governments and dynasties may fall in ruins, but Government Departments live on and preserve their traditions, which are the same in all countries and in all times. If the medical profession chooses to become bureaucratized, well and good; but it should understand what it has to expect.—I am, etc.,

Parkstone, Dorset, March 15th. CHAS. MERCIER.

MINISTRY OF HEALTH BILL.

SIR,—I understand that the Ministry of Health Bill does not of itself create any new system of health control, but aims at co-ordinating the various functions of these many departments so that now, or at some not very remote future, the policy of the single front may characterize our health administration. It is not, therefore, to the point now to discuss the many developments which may arise from the Ministry of Health, but rather to know whether the machinery which is being set up under the bill is of such a character as to give the best possible chance of safeguarding the national health. Let us consider this matter by reference to another department of State such as the Admiralty. The head of this department may or may not have special technical experience, but he must have as his advisers the finest experts in naval matters, and unless this were done, and unless he were bound to consult these technical advisers in every step of naval policy, none of us in time of national danger could sleep calmly in our beds. In the question of national health we are dealing with subjects infinitely more technical and obscure than those which concern the Admiralty, and the nightmare of disease is never absent; have we, then, any guarantee that the highest professional guidance will be at the nation's disposal, and that the Minister of Health will have associated with him a body of professional advisers after the type of the Admiralty Board? This is a matter which the medical profession, as the trustees of the health of the community, are bound to inquire into, and a definite answer should be forthcoming. Happily we have at the head of the Local Government Board a medical man, and we may expect him to see this matter in its true light. It would, however, I am sure, allay a great deal of uneasiness if we could be assured in plain and unmistakable language that the nation's health will be no less effectively directed in the future, whoever might be the Minister of Health, if such there is to be, than is the case with that which is usually spoken of as our "first arm of defence."—I am, etc.,

Harpenden, March 12th. CHARLES F. HARFORD.

URETERS AND THEIR ORIFICES IN GUNSHOT WOUNDS OF THE SPINE.

SIR,—Mr. Thomson Walker's use of the term "catheter infection," which occurs three times in his letter published in the JOURNAL of March 15th, is somewhat misleading. It suggests that every infection of the bladder in paraplegic patients comes about from catheterization, and, conversely, that if the catheter is not used the bladder remains free from invasion. Neither of these propositions is true. I have seen purulent urine withdrawn by the first catheter passed, a couple of days after the patient had been wounded. I venture to say that I never saw a paraplegic patient whose bladder functions had been in abeyance for more than a day or two, with sterile urine, whether a catheter had been passed or not.

But there are all grades of cystitis, just as there are all grades of bedsore; indeed, the two conditions are somewhat comparable. Whilst, however, there is no form of treatment which will either prevent the infection of a paralysed bladder, or render sterile the urine in it, the degree of the cystitis can be controlled by various means, of which suprapubic cystotomy is one. Cystitis in a paraplegic patient can only be cured by the return of functional activity of the bladder, either voluntary or reflex. If neither of these forms of functional activity can be

restored, nothing can prevent the ultimate fatal termination from pyelonephritis.

One advantage of cystotomy is that it facilitates the cleansing of the bladder by mechanical means. Further, when septic urine is no longer contained under pressure in a closed bladder, not only is ureteral dilatation avoided, as Thomson Walker has pointed out, but toxic absorption is diminished. With the lessening of toxaemia, the reflex activity of the spinal cord is increased, as Head and Riddoch have shown; with the return of functional activity of the bladder, the cystitis tends to clear up.

But when the advantages of the operation are being reviewed, it must be remembered that the state of a paraplegic patient in a base hospital with a suitable tube passing through an otherwise watertight suprapubic opening, is very different from one with a leaking suprapubic opening from which the urine flows over the hips and soaks the bedding, who is being passed down the line from hospital to hospital. It was the state of such patients, in the earlier months of the war, which very properly led to the abandonment of suprapubic cystotomy as a routine measure at the clearing stations.

Mr. Thomson Walker (February 15th) states that in the hands of American surgeons the plan of abandoning the bladder to passive overflow (assisted by massage) has been followed by good results, namely, the absence of urinary infection. Colonel Forbes Fraser (March 8th) writes of the similar plan of emptying the bladder by "expression" as "simple and satisfactory."

Both these statements, if true, are capable of proof, and the importance of the matter is sufficiently great to justify the hope that such proof will be forthcoming.—I am, etc.,

London, W., March 18th. PERCY SARGENT.

THE TREATMENT OF VENEREAL DISEASE.

SIR,—In his very appreciative comment on the article by Surgeon Commander Boyden and me in the BRITISH MEDICAL JOURNAL of February 8th, Sir Bryan Donkin urges that "this matter [the prevention of venereal disease] should be fully considered by a responsible body of medical experts before any public scheme is adopted to bring this necessary sanitary measure to the knowledge of the civilian community in a practical manner."

The same suggestion was recently made in the *Times* by Sir Bertrand Dawson. Doubtless such a body of experts will ultimately meet. But its labours would be assisted if an antecedent light were shed on one point—the action of calomel, a drug which has been, and still is, more widely used, not only for the cure but also for the prevention of venereal disease, than any other.

There can be no doubt as to the action of potassium permanganate and other active antiseptics. They are antiseptics because they are soluble poisons. Being soluble they are brought into intimate contact with the micro-organisms of disease, which are thus destroyed. But calomel is quite insoluble. If, then, it is an antiseptic, its action is mysterious without parallel.

We know, of course, that the introduction of calomel within the tissues, whether by the mouth, by intramuscular injection, or by inunction, tends to destroy the spirochaete of syphilis. But is it *calomel* that acts in this way? The mercurial compound becomes soluble, for its action extends far beyond the site of introduction. It seems evident, therefore, that the calomel undergoes a chemical change. Possibly it takes up another atom of chlorine and it is transformed into perchloride, or possibly it becomes an albuminate.

If calomel, as such, is not antiseptic, if it becomes an antiseptic only after it has undergone a chemical change within the tissues, then, plainly, its rôle is not to prevent but to cure disease—it may be disease which has been contracted only a few hours previously, but still actual disease. It is claimed, doubtless with truth, that calomel cream rubbed on the penis and injected into the urethra tends to prevent both syphilis and gonorrhoea. But it is at least conceivable that the action of the cream is then purely mechanical, that the vehicle in which the calomel is suspended cleanses the surface of the penis and plugs the urethra. It is known that simple washing with soap and water, or water alone, is, in lack of more certain means, an excellent preventive of venereal disease. The somewhat higher proportion of failures to prevent venereal disease which follows the use of calomel, as compared to the almost complete prevention of disease which follows the early use of an active antiseptic, would seem to indicate that calomel acts rather as soap and water does than as an antiseptic.—I am, etc.,

Southsea, March 14th. G. ARCHDALL REID.

MALARIA IN ENGLAND.

SIR,—Is it not time that some action was taken to deal with the problem of malaria in England? That it has been made a notifiable disease is certainly important, but it falls far short of meeting the urgent need of preventing and checking the disease.

There are at least two known mosquito carriers in England, and in several areas malaria is endemic; probably there are many more districts which have not yet been defined.

Where antimalarial precautions have been taken, they in most cases hardly come up to the standard recognized as efficient by those who have had actual practice in antimalaria work. At the moment men suffering from active malaria are being dispersed all over the country. Few practitioners have had experience of malaria, and fewer still understand the treatment of the severer types.

During the recent cold spell cases of cerebral malaria have occurred. If adequately treated such cases recover, but unless the practitioner attending recognizes the condition to be malaria, and not one of the many diseases which produce cerebral symptoms, the patient will die.

I submit that every possible precaution should be enforced to prevent the spread of malaria, and that steps should be taken to provide adequate treatment for those suffering from the disease.—I am, etc.,

February 27th. INFECTED.

THE EPIDEMIOLOGY OF INFLUENZA AMONG WORKERS.

SIR,—With reference to the note on this subject in your issue of March 1st, and incidentally with that on the Imperial College of Science, the following observation may be of interest: When I was on the metallurgical staff of the Royal School of Mines (Imperial College of Science) many years ago, I had to conduct the metallurgical students over the smelting works of South Wales. In those days the reverberatory process of copper smelting was almost solely employed at Swansea, and the atmosphere seemed little else than sulphur fumes at times. I was constantly told that consumption was practically unknown amongst the copper smelters. I naturally at first attributed this, like everybody else then, to the SO_2, etc., in the air. We were accustomed, however, to go on to the smelting works at Dowlais also, where the old open-topped iron blast furnaces were still in use. Here I was told that the men charging the furnaces—at the top, that is—frequently got consumption, but not those at the bottom, engaged in tapping the furnaces. They worked in fumes. These were not sulphur fumes, but they contained sulpho-cyanides, and as these would have been present at the copper works also, it occurred to me then—and still does—that possibly in the use of sulpho-cyanides there may be found at least a partial cure for phthisis.—I am, etc.,

Bristol, March 2nd. E. J. BALL.

TREATMENT OF ACUTE GONORRHOEA.

SIR,—I read Major Fogarty's article (BRITISH MEDICAL JOURNAL, March 1st, p. 245) with much interest. I do not use either germicides or massage, but drain the urethra with gauze soaked in a lymphagogue.

The gonococcus is an anaërobic organism, and so cannot live in healthy serum; it penetrates easily the urethral mucosa, so that if a substance could be found which would produce a flow of fresh serum it would serve a double purpose—first, by washing out the cocci from the deeper tissues, and then by producing a soil inimical to their growth.

Sir A. Wright's lymphagogue is given the credit of possessing this property. It is composed of sodium chloride 5 per cent. and sodium citrate 0.5 per cent. At first I irrigated the urethra with the solution, but the results were not very promising, probably because the solution was not in contact long enough to produce

osmosis; I then tried instillation and sealing up the meatus, but this was not satisfactory. I therefore introduced a gauze drain soaked in the solution. The urethra is irrigated with the solution, and then I introduced through a Luys's urethroscopic tube a long strip of sterile gauze soaked in the lymphagogue. The tube is withdrawn and the gauze left behind. The danger of introducing a tube into the acutely inflamed urethra was my difficulty, but by selecting the cases and taking precautions I was fortunate enough to avoid complications and to obtain very satisfactory results.

I have not ventured to treat posterior urethritis by gauze draining, and, unlike Major Fogarty, would hesitate to pass a tube into the posterior urethra, or even leave behind a gauze drain gripped by the compressor muscle.—I am, etc.,

Manchester, March 1st. M. W. BROWDY, M.B.

SHELL WOUND OF THE HEAD WITH LARGE FRAGMENT LODGED IN THE CEREBRUM.

SIR,—With reference to Dr. Russell's article in your issue of February 22nd under the above heading, in which he states that it would be interesting to determine what proportion of such cases recover and how many later on develop cerebral abscess or mental symptoms, I should like to state that for a period of over two years, during which I was in charge of 1,000 beds, set apart especially for treatment of the psychoses in their early stages, a great number of cases with head injury passed through my hands. I have compiled a statistical record of 100 of these, which I hope to publish shortly. I might mention here, however, that amongst this number only 15 per cent. were epileptics, four of whom still had metal in the skull and one a frontal abscess. In the *Journal of the R.A.M.C.* of September, 1916 and 1918, will be found a review of cases of head injury met with surgically by Lieut.-Colonel Holmes and Lieut.-Colonel Sargent. They found that epilepsy only accounted for 6 per cent. of their cases, but it must be remembered that they met the cases much earlier and did not follow them to their final termination.

My experience convinces me of the importance of *x*-ray examination, even in apparently trivial injuries if this is followed by complaints of persistent headache. There were many injuries in which this examination had been neglected on the grounds that external evidence did not justify it, but in which subsequent *x*-ray examination revealed extensive fractures. Small scars are no criterion that there are not greater injuries underneath and even metal in the brain. While urging the more universal use of *x*-ray examination for head injury I should warn medical officers against disclosing the findings of the examination to the patient, for there is little doubt that in some cases the mere knowledge possessed that he has metal in his skull will start the idea that he will of necessity be a permanent invalid, although the metal may be lodged in a harmless situation.—I am, etc.,

R. EAGER, M.D.,
Major R.A.M.C.(T.F.).

The Devon Mental Hospital, Exminster.

A CHLOROFORM DANGER.

SIR,—I see an unfortunate accident reported in the daily papers in which apparently a patient lost her life through no fault of her anaesthetist, owing to liquid chloroform being pumped into her respiratory passages through a Junker apparatus. This danger of this accident when the bellows of the apparatus are attached to the wrong tube is well known and the fatality in this case was *not* due to this cause.

For this reason it seems worth while to point out that liquid chloroform can easily be pumped out of many Junker bottles although quite correctly put together if, as is often the case, the vapour exit is placed too low or the full two ounces of chloroform, for which the bottle is almost invariably graduated, are inserted. I refer to the ordinary Buxton's bottle (or one of its modifications) which is in general use. Having noticed this some time ago I have during the past few days tested several bottles which I had previously considered quite safe, and I find that in all of them liquid chloroform can be ejected if they are filled to the upper graduation and the pumping is at all violent.

The remedy is to limit the amount of chloroform placed in the bottle invariably to one ounce, which is quite sufficient and is perfectly safe, unless the bottle is more than usually faulty. It would be well if instrument makers would graduate the bottles for one ounce only, or, alternatively, use longer bottles (which are rather cumbersome), or place the vapour exit higher, though this exposes to danger from tipping the bottle.

I do not wish to be understood as saying that all Junker bottles are faulty, but as I find that many of them are, it seems right to draw attention to the point, as it can so easily lead to a fatal accident.—I am, etc.,

London, W., March 11th. C. F. HADFIELD.

DISINFECTANT TESTING.

SIR,—During the war the subject of an international test for disinfectants has been in abeyance, as your readers are aware, although the War Office has been using the Rideal-Walker test extensively for controlling the large quantity of disinfectants which have been supplied to the various fronts.

At the last meeting of the International Congresses on Applied Chemistry and Hygiene, in New York and Washington respectively, in 1912, two committees were formed to take this matter up, and by this time meetings would have been held in Petrograd, and further progress in the international test would probably have resulted.

Difficulties have also arisen with regard to peptone, as, owing to the war, the supplies of Witte's peptone hitherto used were not available. Workers were thus further delayed, and this necessitated the problem of finding a substitute. Many have been examined both in this country and in the United States, and have been found to vary considerably. The variation between different brands has been shown recently in the results obtained in the Research Laboratories of the Royal Institute of Public Health, and elsewhere.

Through the courtesy of the British Disinfectant Manufacturers' Association, I have had the opportunity of considering the standard specification which they have agreed together to adopt. The method of testing, which they have formulated from their combined experience, does not depart very materially from that originally put forward. It should be as widely known as possible, since I understand that all these manufacturers will be employing this technique for their standard.

STANDARD BACTERIOLOGICAL TEST (RIDEAL-WALKER METHOD).
Adopted by all members of the British Disinfectant Manufacturers' Association.

Shake the bottle or other vessel containing the disinfectant well, before proceeding to make the dilution. Make a 1 p.c. stock emulsion (5 c.cm. of disinfectant added to 495 c.cm. of boiled distilled water of 15°C.–18°C.). From this stock emulsion prepare required dilutions in boiled distilled water, taking care that pipettes used for preparing stock emulsion as well as dilutions are, after emptying, always well washed out with and into the diluent, and that all dilutions, including stock emulsion, are well shaken before use. To 5 c.cm. of a particular dilution add 0.2 c.cm. (5 drops) of a broth culture of *B. typhosus* grown for 24 hours at 37°C. Shake immediately after medication. Keep medicated tubes at temperature of 15°C.–18°C. and take subcultures into 5 c.cm. broth every 2½ minutes up to 10 minutes. Incubate for at least 48 hours at 37°C. (Rideal and Walker, *J. S. I.*, Oct., 1903, p. 424.)

Use as stock organism *B. typhosus* from a single colony on an agar plate culture that has been grown at 21–22° C. from two to seven days and removed by weekly transference for several uninterrupted generations from the original source (the human body).

Owing to the extremely important influence which the broth has on the characteristics of the *B. typhosus* employed as the test organism in the Rideal-Walker test, *particularly as regards the peptone*, attention is drawn to the fact that this is prepared according to the following modification of the formula of Dr. S. Rideal (Fourteenth International Congress for Hygiene and Demography, Berlin, 1907):—

Lemco, 20 grams. Peptone (Allen and Hanburys' "Eupepton"), 20 grams. Sodium chloride, 10 grams. Water to 1 litre. Boil the mixture for 30 minutes, neutralize with normal caustic soda (phenolphthalein indicator), add 15 cubic centimetres of normal hydrochloric acid; make up to 1 litre with distilled water, filter and finally sterilize.

The culture employed must conform with the requirements laid down by the authors of the test (v. *Lancet*, 25th September, 19 5, p. 717), viz., "Life in 2½ and 5 minutes and no life thereafter," with "phenol dilutions not higher than 1–110 or lower than 1–90."

It is of course important that whatever peptone is employed in making the broth for the cultures it should contain as nearly as possible the same freedom from sugar and salt as did the majority of the samples of Witte's peptone used for this test before the war. Also the peptono finally adopted for an international test should be as readily obtainable as lemco in all countries. Personally, I see no reason why the test in the form in which it has been drawn up by the manufacturers of this country

should not harmonize with the views of workers in other countries.

It is hoped that the difficulty in connexion with the strain of *B. typhosus* to be used in the test may also be eliminated by all workers agreeing to use the same organism, as is now the case in America. Perhaps a central authority, such as the Lister Institute, would consent to maintain and distribute a standard agreed strain. I suggest that the Rawlins's strain, which has been used by the War Office and several manufacturers as well as myself, should henceforth be used as the test organism. General use of this test organism would therefore be of considerable advantage, and I hope that the Lister Institute will be willing to act in this capacity.

One other point before concluding is to draw attention to the fact that although large quantities of British-made disinfectants are used in tropical countries and in our various campaigns, the control in this country has been made at the temperature originally suggested—namely, 15° to 18° C., and this standard temperature is adopted now by the British manufacturers. This is different from the practice at present employed in America, where, owing to the large quantities of disinfectants being shipped to Cuba, the Panama zone, and the Philippine Islands, the American workers have adopted the higher temperature 20° C., as being more comparable with the conditions of the users. There is, of course, no difficulty in working at the English temperature even in a tropical climate, as ice is always available. No Government department, however, seems to have taken this point into consideration.—I am, etc.,

London, S.W., March 17th. SAMUEL RIDEAL.

MEDICAL DEMOBILIZATION.

SIR,—In the House of Commons, on March 4th, Mr. Churchill stated, in reply to Mr. Lyle:

I have not been at all satisfied with the rate at which demobilization of doctors is proceeding, and I have given very strong orders that all efforts are to be made to demobilize doctors at an increasing rate, to make sure, now that the fighting is stopped, we have not a greater number of medical men on our establishments overseas who are more urgently needed at home.

It is well known that by far the greater number of the doctors still serving are most anxiously awaiting release from the service to return to their depleted private practices; but, at the same time, one hears daily of efficient medical officers receiving demobilization orders when they have signified their wish to remain with their military units (I personally know of three such cases among my friends occurring within the past fortnight). Surely it would be wiser, as well as more just, to leave these officers to carry on, at least until all the unwilling ones were dealt with. This haphazard method is distinctly characteristic of War Office methods, but could not the Association put its machinery into force to alter these Gilbertian proceedings to the benefit of all concerned?—I am, etc.,

E. LUKE FREER, V.D.,
Lieut.-Colonel R.A.M.C. (retired).

London, S.W., March 18th.

*** The plans worked out by the Central Medical War Committee in concert with the authorities have recently been scrapped by Mr. Winston Churchill.

NATIONAL MEDICAL TREATMENT.

SIR,—The scheme outlined by Drs. Howarth and Richmond (BRITISH MEDICAL JOURNAL, March 8th, p. 274) demands serious consideration and criticism. Apparently they desire to make it so difficult for members of our profession to make a living by private practice that one and all shall be compelled sooner or later to become panel practitioners. There is certain to be a very large and important section of the profession who will to the very last resist any scheme which involves this. I am not sure that I shall not belong to them.

If any scheme is to meet with general support and approval from the bulk of the profession—and without general support and approval failure is almost certain—it appears to me essential that it should offer to doctors advantages which they do not at present possess and remedy or alleviate wrongs and disabilities from which they have long suffered.

The great disadvantages that doctors in general practice suffer from are—first, that they are compelled to work for excessive hours. A working week of from seventy to eighty hours is not only not unusual, but even customary during greater part of the year. Secondly, holidays are extremely difficult to obtain, and so costly, because of the high fees now demanded by locumtenents and the immediate drop in income that follows their engagement, that doctors frequently decide to do without them. Thirdly, a breakdown in health means, in most cases, a cessation of income and, if long continued, ruin of the practice. Such continuous and arduous work is neither good for the doctor nor his patients. He has little or no leisure for reading, no opportunity for post-graduate study, or amusements, or social intercourse. Lastly, a general practitioner has no scope for his ambition. Once a general practitioner always a general practitioner, and, though his practice may become in time unmanageably large, he has still, after years of experience, to attend to the same trivial cases and accept the same inadequate fees as his most junior colleague.

Drs. Howarth and Richmond's scheme does nothing to remedy these wrongs. The doctor's hours at the clinic are certainly to be limited, but he is to be at the end of a telephone, and liable to be called upon to go at any hour of the day or night to see anybody who likes to ask for him; and for this he is to be inadequately paid, for the authors of the scheme propose, in order to prevent excessive visiting, that the fee for a visit should approximate to that for a consultation. I am quite prepared to agree that visiting should be discouraged, but it should not be by underpayment. The proper method would be to offer every patient who was too ill to attend the clinic as an out-patient a hospital bed with free nursing and treatment, but make him pay himself, and on a liberal scale too, for all visits at home.

It is true that the scheme would offer us the advantage of a pension, but only on a contributory basis, and then at the end of forty years of panel practice. I do not think that the man who could survive forty years of panel practice has yet been born.

For the general public the only advantage that the scheme offers is that everybody would be entitled to some kind of medical treatment free. It obviously would not be the best kind, because doctors are, under the scheme, to have the opportunity for the "sternest competition." Apparently the kind of competition contemplated is to see how many patients they could see in an hour; the more patients seen, the more fees. Careful and systematic examination of cases would not only receive no reward, but actually be penalized.

Any scheme which offers the same rate of pay to all doctors irrespective of their experience, attainments, ability, and the thoroughness of their work is bound to encourage slipshod methods and to lead neither to the benefit of the public nor the profession. If any scheme of National Medical Service is ever brought into being, one of the things that it ought to offer to the public above everything is protection of the patient against careless work. At present the only protection the patient has—and it would continue to be the only protection under this scheme—is his right to change his doctor and the right to ask for a consultation. In my judgement, this is an insufficient protection; for the patient is very often incapable of telling whether he is being treated with skill and judgement or not, or whether a correct diagnosis has been made.

It would be much better, if ever any such public clinics as suggested are established, to make it a rule that every new patient should be seen by at least two doctors, a senior and a junior, and that the senior should receive a higher rate of pay. The subsequent treatment should be continued by the junior, but in all serious cases consultations between senior and junior should be held.—I am, etc.,

J. A. BUTLER, M.D.

Goldhawk Road, London, W.; March 9th.

A METHOD OF OBTAINING ENDOWMENT FOR MEDICAL RESEARCH.

SIR,—The work of the Rockefeller Institute of New York has shown what can be done, in particular in the fight against tropical diseases, by medical research and

organization when practically unhampered by questions of expense. An endowment of from ten to twenty millions is required for undertakings such as have been carried out by this institute.

The question of the payment of an indemnity by Germany has not yet been decided, but it seems clear that if a financial penalty is to be exacted for anything it should be for actions such as the sinking of hospital ships, the bombing of hospitals, and the deliberate medical neglect of prisoners as at Wittenberg.

Suppose that two thousand lives have been thus taken (a moderate estimate); if a penalty of £10,000 were required for each one of these a sum of twenty millions would be handed over. It is proposed that this should be devoted to the endowment of medical research. The following points may be emphasized:

1. The amount involved is trivial in comparison with the cost of the war, or with the potential wealth lying in the soil of Germany, or with the sum exacted from France in 1871 as an endowment for future warfare.

2. To those persons who may object to any form of indemnity on the ground that this is either a mere act of vengeance, or an excuse for personal gain, one may point out that the results of medical research are the property of the whole world; hence Germany will ultimately benefit under this scheme as much as any other nation. This consideration should appeal even to those devoted to the interests of any country other than their own.

3. It may seem an insult to assess the lives of these men and women in terms of money. But they were all under medical care, or were in urgent need of it, or were themselves in charge of the sick and wounded; it would be appropriate then if their sacrifice were to bring about the future advancement of medicine. Surely they could wish no better memorial.—I am, etc.,

February 14th. PATHOLOGIST.

IRISH MEDICAL SCHOOLS' AND GRADUATES' ASSOCIATION.

THE forty-first annual general meeting of the Irish Medical Schools' and Graduates' Association was held on March 17th (St. Patrick's Day) at Pagani's Restaurant, London, under the presidency of Colonel Sir Arthur Chance, F.R.C.S.I. A very satisfactory report of the finances of the association was presented by the Honorary Treasurer, Dr. Cockle, who was requested to continue in his office for another year. The members and their friends, to the number of 104, including a considerable proportion of ladies, subsequently dined together at the festival banquet of the association. The guests were Sir Watson Cheyne, M.P., and Sir William Whitla, M.P., whose health was proposed by Sir Launcelotte Gubbins, who said that to these gentlemen and the other medical members of Parliament the profession looked with confidence to see that their interests were well guarded in the legislation connected with the promised Ministry of Health Bill. Sir William Whitla, in his reply to the toast, sounded a note of warning as to expectations with regard to the effect of this bill. It was merely a bill enabling machinery to be set up by which future enactments of the legislature might be worked. In Ireland such machinery was already set up, but being entirely permissive it was absolutely useless. The toast of "Our Defenders" was responded to by Colonel Parkes, C.M.G., O.B.E., of the New Zealand Medical Corps. He said that in Auckland there was a strong feeling of reliance on the Royal Navy, and that it was realized by his fellow colonists generally in New Zealand how much their defence from possible attack depended on its being maintained in the highest efficiency. He expressed the gratitude of his brother officers for the hearty way in which the medical profession in England made them welcome here, and their appreciation of the facilities given them for taking advantage of the clinics so liberally placed at their service. The Chairman of Council announced during the proceedings that the Arnott Memorial Gold Medal had been awarded by the Council to Lieut.-Colonel William Tyrrell, D.S.O., M.C., R.A.M.C. The evening was enlivened by several Irish songs, and "God Save the King" was sung very heartily by the company, not only after the toast of "The King," but before the assembly broke up at a late hour.

THE gold medal of the American National Institute of Social Sciences has been awarded to Professor W. H. Welch of Johns Hopkins University.

The Services.

INDIAN MEDICAL SERVICE.

COMMITTEE ON MEDICAL SERVICES IN INDIA.

MR. MONTAGU, in his speech to the deputation from the British Medical Association on June 27th, 1918, said that a matter which required consideration was the relations between the R.A.M.C. as employed in India and the I.M.S. The two services, he said, must be considered together, with a view to promoting harmony, and with a view, so far as possible, to achieving unification. This would mean a drastic reorganization of the Indian Medical Service and of its relations with the Government of India. In his speech to the deputation on the second occasion (February 10th) he said that the Government of India had appointed a representative committee, which had met early in January to examine and report on the reorganization of the medical service in India. The committee, the chairman of which is Sir Verney Lovett, K.C.S.I., Commissioner of Lucknow, has not yet reported, but Mr. Montagu said he hoped to receive it, together with the views of the Government of India upon it, as early as possible. According to the *Pioneer Mail*, the committee is considering whether a Royal Indian Medical Service should be formed, in which the I.M.S. and the officers of the R.A.M.C. in India shall be merged. A matter which will call for the careful consideration of the committee is the strength of the medical reserve which the military authorities think it desirable to maintain in India; hitherto this reserve has been constituted by officers I.M.S. in civil employment.

NEW RATES OF PAY.

We understand that the new rates of pay in the Indian Medical Service are to be calculated by increasing the old grade pay by 33⅓ per cent. and adding the staff pay of the rank. Upon this basis it appears that pay as from December 1st, 1918, will be as follows:

Grade Pay: Rupees a Month.

	Old.	Proposed Scale of New Grade Pay—namely, Grade + 33⅓ % + Staff Pay (calculated).
Lieutenant...	350	617
Captain	400	683
,, after 5 years' service ...	450	750
,, ,, 7 ,, ,, ...	500	816
,, ,, 10 ,, ,, ...	550	883
Major...	650	1016
,, after 3 years as major ...	750	1150
Lieut.-Colonel	900	1550
,, ,, after 25 years' service	900	1600
,, ,, specially selected ...	1000	1733

We are unable to define the position in relation to the Army Instruction (India) No. 1343 of November 19th, 1918, which provided for the introduction of station hospitals for Indian troops and followers. In Appendix "B" to that Order the grade pay of the officers of the Indian Medical Service in military employment was set out and certain charge allowances were shown. The instruction came into effect on December 1st, 1918, which is also the date on which the addition of 33⅓ per cent. to the old rates of grade pay (as set out above) came into effect.

LEAVE PAY.

The Secretary of State for India in Council has approved, with effect from January 1st, 1919, the following revised rates of leave pay for officers of the Indian Medical Service granted leave out of India:

			Old Rates.
On appointment...	£300 per ann.	...	£250
After completion of 3 years' service ...	£350 ,,	...	£250
,, ,, 6 ,, ...	£400 ,,	...	£250
,, ,, 9 ,, ...	£450 ,,	...	£300
,, ,, 12 ,, ...	£500 ,,	...	£300
,, ,, 15 ,, ...	£550 ,,	...	£450
,, ,, 18 ,, ...	£600 ,,	...	£450
,, ,, 21 ,, ...	£650 ,,	...	£600
,, ,, 24 ,, ...	£700 ,,	...	£700

THE ARMY BONUS.

AT the close of January last a Royal Warrant was issued laying down the extra remuneration or bonus which would be given as from February 1st, 1919, to all those who have been definitely selected for retention on military service. The bonus is based on the rank for which pay is being drawn. It is issuable to all officers (including those with permanent commissions in the Regular Army) and other ranks belonging to units whose dépôts are permanently situated in the United Kingdom, Channel Islands, Isle of Man—including British service troops serving in India; to officers and men of the South African Overseas contingent drawing British rates of pay; and in such other cases as the Army Council may authorize. The period during which the bonus will be paid to officers and men definitely retained will be that for which it is found necessary to maintain Armies of Occupation. We understand that it has been officially ruled that the bonus is issuable to the whole of the personnel of the R.A.M.C., including Regular, Special Reserve, Territorial, and Temporary Officers. The schedule to the Royal Warrant prescribed the weekly rates at which the bonus would be issued; thus a second lieutenant receives 24s. 6d. a week, a lieutenant 28s., a captain 31s. 6d., a major 35s., a lieutenant-colonel 38s. 6d.; officers of higher ranks 42s. It was at first laid down that officers and other ranks who have not been definitely selected for retention, but who, nevertheless, have not been released from service by April 30th, would in general be credited with a bonus at half the rates shown in the schedule for any period of service they may be required to give after May 1st, 1919. Under a further Royal Warrant, however, the full rate of bonus, instead of half rate, will be paid to officers and other ranks who, although not selected to form part of the Armies of Occupation, have not actually been demobilized on May 1st next.

TERRITORIAL DECORATION.

THE Territorial Decoration has been conferred upon the following medical officers:

Honourable Artillery Company. — Surgeon-Major John F. Taylor.

Royal Army Medical Corps.—Lieut.-Colonels: L. J. Blandford, F. Kelly, G. B. Masson, J. M. Rogers-Tillstone, H. W. Thomson, D.S.O. Temporary Lieut.-Colonel Wheelton Hind. Majors (temporary Lieutenant-Colonels): John Gray, Charles Stonham, C.M.G. (deceased). Major (acting Lieutenant-Colonel) Richard T. Turner. Major and Brevet Lieutenant Colonel Arthur B. Harris. Majors: Henry Dodgson, W. J. Mackinnon, A. C. Oldham, Walter R. N. Smithard, William A. Taylor, Abraham Thomas.

Universities and Colleges.

UNIVERSITY OF OXFORD.

AT a congregation held on March 13th the degree of Doctor of Medicine was conferred upon L. M. Davies.

UNIVERSITY OF CAMBRIDGE.

AT a congregation held on March 14th the following medical degrees were conferred:

M.B. AND B.CH.—L. M. Ingle (by proxy).
M.B.—W. B. Gordon.
B.CH.—L. R. Shore.

Dr. Hamilton Hartridge, Fellow of King's College, has been appointed University lecturer in physiology of the special senses until September 30th, 1923. Mr. J. Barcroft and Mr. A. V. Hill have been appointed University lecturers in physiology for the same period.

UNIVERSITY OF ABERDEEN.

AT the meeting of the University Court on March 11th communications were read from the Carnegie Trustees stating that the quinquennial distribution of grants had been further postponed, but the grant of £8,000 to the university would be doubled in the next academic year for that year only, and that a grant of £800 a year for three years would be made towards the payment of salaries of assistants who should give half their time to research.

THE COUNCIL OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

MONDAY last, March 17th, was the last day on which notices of nomination could be received from candidates for the election of members of the Council of the Royal College of Surgeons on July 3rd. There are six candidates for the two vacancies. Sir Berkeley Moynihan, K.C.M.G., Leeds (F. 1890), who seeks re-election; Mr. A. H. Tubby, C.B., Westminster Hospital (F. 1887), Mr. Cuthbert S. Wallace, C.B., St. Thomas's Hospital (F. 1893), Mr. Francis James Steward, Guy's Hospital (F. 1898), Mr. William Francis Victor Bonney, Middlesex Hospital, representing obstetrical and gynaecological surgery (F. 1899), and Mr. John Frederick Jennings (F. 1903), of John Street, Berkeley Square, W., who comes forward as a representative of general practitioners. An analysis of the Council as it now stands appeared in the JOURNAL of last week, p. 329.

Obituary.

WILLIAM ALEXANDER, M.D., F.R.C.S.,

Honorary Consulting Surgeon, Royal Southern Hospital, Liverpool.

WE regret to have to record the death of Dr. William Alexander, which took place rather suddenly on March 9th. Up to within a few days he was actively engaged in work, and apparently in good health.

William Alexander was born in Holestone, co. Antrim, and studied medicine at Queen's College, Belfast. As a student he had a brilliant career, winning many scholarships and prizes. In 1870 he graduated M.D., R.U.I., obtaining the gold medal and exhibition, and in 1877 took the F.R.C.S.Eng. He was appointed resident medical officer at the Liverpool Workhouse Hospital, and, after settling in private practice, visiting surgeon to that institution. It was there he developed that remarkable skill which made him one of the leading surgeons in the north of England. In 1881 he won the Jacksonian Prize for an essay, "The pathology and surgical treatment of diseases of the hip-joint," and in 1883 the Sir Astley Cooper Prize for his paper on "The pathology and pathological relation of chronic rheumatic arthritis." In gynaecology he introduced new methods for treating inveterate uterine displacements, and published a treatise on this subject. But Dr. Alexander will be remembered best for his work on epilepsy, and particularly as founder of the Home for Epileptics at Maghull. Impressed with the hopelessness of the outlook of epilepsy he determined to alleviate this condition; the results at the Maghull Institution have been most gratifying. He introduced ligature of the vertebral arteries in the treatment of epilepsy in 1882. In 1889 he was appointed honorary surgeon to the Royal Southern Hospital, which post he retained until 1910, when he retired also from the post of visiting surgeon to the Brownlow Hill Infirmary after forty years of unstinted service.

In many respects Dr. Alexander was an exceptional man. Gifted as a great surgeon, he was unostentatious in manner, his opinions were lucidly expressed, and in speech he was never redundant. He saw clearly, made up his mind, and acted accordingly. In private life he was kind-hearted, and many a patient received pecuniary assistance from him in hours of distress.

Dr. William Alexander had been a widower for many years, and lost his only son, Dr. Moore Alexander, a pathologist of repute, in 1915.

The funeral took place at Heswall on March 13th. Many of his professional brethren and representatives of the institutions which Dr. Alexander had served so faithfully were present to pay their last respects.

ROBERT SYDNEY MARSDEN, M.B., D.Sc.ED., F.R.S.E., F.I.C., D.P.H.,

Medical Officer of Health, Birkenhead.

THE death of Dr. Marsden, the Medical Officer of Health of Birkenhead, on March 8th, came as a painful surprise to many of his friends. He had been confined to his bed with bronchitis for a week, when fatal pneumonia supervened. Robert Sydney Marsden was born in Sheffield in 1856, studied science in Edinburgh University, where he graduated B.Sc. in 1877, and in 1879 was appointed lecturer in chemistry at University College, Bristol. He afterwards entered upon his medical career, taking the degrees of M.B., C.M.Edin. in 1885. Dr. Marsden was then appointed medical officer of health of Malton, and in 1891 became medical officer of health of Birkenhead. On all matters pertaining to public health Dr. Marsden enjoyed an eminent position, and was frequently called upon to give evidence before Royal Commissions and Parliamentary Committees. He possessed considerable literary ability, and contributed many papers of scientific and historic interest to the Birkenhead Literary and Scientific Society. The sanitation of Birkenhead owes much to his untiring efforts, and many improvements have taken place under his guidance. The system of sewer ventilation was revolutionized by him with great benefit to the inhabitants of the town. Dr. Marsden leaves a widow and one daughter. The funeral took place on March 13th. Many of the public officials of Birkenhead and medical friends were present to testify their regret.

MR. STEWART HENRY ROUQUETTE, who died on February 27th at the early age of 32, was the son of Mr. G. A. Rouquette of Eastbourne. He received his medical education at Cambridge University and St. Thomas's Hospital, and took the diplomas of M.R.C.S., L.R.C.P.Lond. in 1911, and the F.R.C.S. in 1912. He graduated M.A., M.B., B.C.Camb. in 1913, and M.C. in the following year. He won the Solly gold medal at St. Thomas's Hospital in 1912, and after serving as surgical registrar, casualty officer, resident anaesthetist, and house-surgeon at the hospital, was appointed resident assistant surgeon. He was also consulting surgeon to Lady Ridley's Hospital for Officers, and he was amongst the recent recipients of the Order of the British Empire (Civil Division) for services rendered in or in connexion with military hospitals, etc. His death has cut off a career of great promise to the medical profession. Mr. Cuthbert Wallace, C.B., C.M.G., writes: The school and hospital of St. Thomas has suffered a great loss. Rouquette was one of those quiet men who steadily develop along their own line. That he had a future before him was soon apparent to those with whom he was brought into contact when he joined the hospital. Although very unassuming he was full of ideas and enthusiasm, and well able to present his own opinions. He had a wide knowledge for his years. In the handicraft of surgery he was far advanced, and had developed a technique that for skill, gentleness, and patient celerity was remarkable. This stood him in good stead along a line that he was developing at the time of his death—namely, the operative treatment of exophthalmic goitre. A large series of such cases was already to his credit with an extraordinary low mortality.

SURGEON GENERAL THOMAS FRANCIS O'DWYER, Army Medical Service (retired), of Clifton, Bristol, died in a nursing home on February 5th, aged 77. He was born on December 26th, 1841, graduated M.D. with honours in the Queen's University, Ireland, in 1862, and took the diploma of L.R.C.S.Edin. in 1863. He entered the army as assistant surgeon in 1864, became surgeon-general in 1896, and retired on December 26th, 1901. From 1865 to 1868 he served in the 22nd Foot, the Cheshire Regiment, and as surgeon-general held the posts of principal medical officer of the south-east district and at Aldershot. He served in the Egyptian war of 1882, being present at the battles of Kassassin and Tel-el-Kebir, was mentioned in dispatches in the *London Gazette* of November 2nd, 1882, and received the medal, the Khedive's bronze star, and a special promotion; and in the Sudan campaign of 1884–5, as Secretary to the P.M.O., when he was again mentioned in dispatches, in the *London Gazette* of August 25th, 1885, and received a clasp.

LIEUTENANT-COLONEL THOMAS WALTER IRVINE, Bombay Medical Service, was accidentally drowned in the Kabul river while hunting at Peshawur on January 26th, aged 53. He was born on October 21st, 1865, the only son of the late Rev. Walter Irvine of Edinburgh, and educated at Edinburgh University, where he graduated M.B. and C.M. in 1887. Entering the I.M.S. in 1891, he became major in 1903 and lieutenant-colonel in 1911. After five years' military duty, he took civil employment under the Foreign Department of the Government of India in November, 1902, and was then attached to the Seistan Arbitration Commission, which laid down the boundaries between Persia and Afghanistan. In December, 1907, he was appointed residency surgeon of Mewar (Udaipur) in Rajputana; in October, 1911, chief medical officer of the North-West Frontier Province, with head quarters at Peshawur, and subsequently acted for a time as senior surgeon to the Government of Maisur. He served in the third China war of 1900, receiving the medal; and in January, 1911, received the Kaisar-i-Hind medal, 1st class.

DR. JAMES A. SHOOLBREAD of Edinburgh died from pneumonia following influenza on February 22nd. He was educated at the University of Edinburgh, where he graduated M.B., C.M. in 1897, and B.Sc. (Public Health) in 1901. He had been in general practice in Edinburgh for the last twenty years. He had held the offices of senior demonstrator in materia medica and pharmacology in the Edinburgh School of Medicine, and resident medical officer to the Edinburgh Royal Infirmary Convalescent Home at Corstorphine. He found time for several public activities in the city, notably as a member of the School Board, on which he served for many years. He was much loved and respected by all his patients, and will be greatly missed by a large circle of friends.

DR. HENRY DONALD WELPLY died at Toowoomba, Queensland, Australia, on March 11th, of pneumonia, aged 28 years. He was educated at Edinburgh University, and graduated M.B., Ch.B. in 1914; soon afterwards he held the post of house-surgeon at Leicester Royal Infirmary, and from there early in 1915 he received a commission in the R.A.M.C., being promoted to the rank of captain in the following year. Shortly after joining up he was sent to Egypt, where he contracted a serious attack of dysentery, which ultimately led to his discharge from the army in May, 1917, on pension, retaining the honorary rank of captain. The following autumn he went to Australia, where for the past year he had been practising in Queensland. His many friends will miss him, while his memory will ever remain green in the lives of his sorrowing widow, parents, brother, and sister.

Medical News.

COLONEL A. H. TUBBY, C.B., C.M.G., surgeon to the Westminster Hospital, who has served for a prolonged period in Egypt, has now relinquished his commission and returned to civil practice in London.

THE late Sir Herman Weber left estate valued at £195,668 and Dr. Thomas Buzzard at £194,595.

THE orders controlling the sale of bismuth and the use of kelp for the preparation of potassium compounds have been suspended.

THE American Red Cross has established a fully equipped modern military hospital for sick and wounded men of the Czecho-Slovak forces near Cognac in France. The medical officer in charge and all the personnel are members of the Czecho-Slovak army.

ST. MARY'S HOSPITAL is to be added to the list of medical schools and hospitals sharing in the emergency post-graduate courses in London. It is arranging a three months' course. A full list of medical schools and hospitals was published in the issue of March 8th, p. 281.

THE Harveian Lecture of the Harveian Society will be delivered at the rooms of the Medical Society of London (11, Chandos Street) on March 27th, at 8.30, by Mr. Edred Corner, F.R.C.S. His subject will be nerves in amputation stumps. Members of the medical profession are invited to be present.

IN our advertising columns this week particulars are given of a special three months' course of post-graduate study at the Charing Cross Hospital Medical School, beginning on April 7th, and an announcement of the setting up of an ophthalmic clinic, in affiliation with the Royal Westminster Ophthalmic Hospital.

HOSPITALS within nine miles of Charing Cross, and convalescent homes and sanatoriums for consumption taking a large proportion of patients from London, if they desire to participate in the grants made by King Edward's Hospital Fund for London, must make application before March 31st to the honorary secretaries, 7, Walbrook, E.C.4.

WE are informed that the meeting to be held on March 31st to discuss the formation of a medical post-graduate association in London will be attended only by representatives of the medical teaching institutions in London, who will report on the attitude of the hospitals they represent towards the scheme in its present form. It is proposed to hold a public meeting in April.

THE preparation of a programme for the extension of Red Cross work to civilian needs is to be considered, as already announced, by an international congress of national Red Cross societies to take place at Geneva thirty days after the signing of peace. The preliminary meeting at Cannes to formulate a programme for the conference will take place at the end of this month or early in April. The British members will be Sir Arthur Newsholme, K.C.B., Colonel Sir Ronald Ross, K.C.B., K.C.M.G., Sir Robert Philip, M.A., M.D., Dr. F. N. Kay Menzies, Dr. Truby King, C.M.G., Sir Walter Fletcher, K.B.E., F.R.S., Sir Leslie Mackenzie, M.D., LL.D., Colonel S. Lyle Cummins, C.M.G., A.M.S., and Colonel L. W. Harrison, D.S.O.

THE Royal Institute of Public Health is arranging a conference on the problems of reconstruction in relation to public health at the Guildhall, London, from June 25th, when it will be opened by the Lord Mayor, to June 28th. Particulars can be obtained on application to the Secretary of the Institute, 37, Russell Square, W.C.1.

Le Scalpel of Brussels, the issue of which has been suspended since the beginning of the war, came to life again, in a somewhat changed form, in January. Owing to the shortage of paper, weekly publication is impossible for the present. The *Scalpel*, which is edited by Dr. L. Dejace, was founded in 1847.

MR. MUIRHEAD BONE, who has been an official artist since August, 1916, and whose war drawings will be preserved in the national collections, has undertaken to set aside the proceeds from the sale of his signed lithographs, and to devote this sum, amounting to about £2,000, to purchase the work of other artists for presentation to the Imperial War Museum.

IN a communication to the Royal Society (February 20th) S. S. Zilva and E. M. Wells said that the structure of the teeth of guinea-pigs and monkeys subsisting on a scorbutic diet undergoes radical changes resulting in total disorganization of the pulp. Alterations in the odontoblastic cells and dilatation of the blood vessels can be observed before any systemic abnormality can be recorded with certainty.

BY a decree of the French Minister of the Interior, dated February 4th, a committee, under the presidency of the Under-Secretary of State, was set up to inquire into the sanitary conditions of the liberated territories of France and to suggest measures of improvement. Among the members are Dr. Roux and Dr. Calmette, past and present directors of the Pasteur Institute; Dr. Faivre, Inspector-General of the administrative services of the Ministry of the Interior, and Drs. Netter and Widal, members of the Superior Council of Hygiene.

AT the meeting of the West London Medico-Chirurgical Society on March 7th, when Lieut.-Colonel E. M. Wilson, C.B., C.M.G., was in the chair, the West London triennial medal awarded to Surgeon Commander Francis Bolster, R.N., for heroism on a sinking ship during the battle of Jutland, was presented. The Medical Director-General R.N. expressed the cordial approval of the service in the choice made by the council of the society, and said that he could not imagine a more worthy recipient. A large number of members and guests of the society were present and heartily acclaimed Surgeon Commander Bolster.

PROFESSOR M. SEGALE has published in *Pathologica* (xi, 243) a long paper on bacteriological researches into the pandemic of influenza last year, carried out at a military bacteriological laboratory. He describes an organism, which he calls *Streptococcus pandemicus*, measuring 0.8 by 1.3 μ, or 1.2 by 1.7 μ, according to the medium. It is therefore much larger than the organism described by Bradford, Bashford, and Wilson. Moreover, Segale's organism grows aërobically, which the other does not. Segale did not filter his material. There does not seem to be any reason to think that changes in the lungs and other organs following his inoculations are more like those of influenza than the experimental lesions produced by Nicolle and Lebailly and by Gibson, Bowman, and Connor with filtered material. On the other hand, Segale's *S. pandemicus* may be a potent secondary invader responsible for pneumonia and bronchitis. His research does not seem to touch the question whether a filter-passing virus is the real cause of the epidemic, apart from secondary infections or complications.

DR. LEDENT, who was in charge of the medical aid service for deported Belgians on their return through Lille in 1917, states that forty thousand passed through his hands. The Germans would only allow the establishment of urgency aid posts. A regular service such as existed for the evacuated territories in France would have shown too plainly the wretched condition of the repatriated prisoners; hence all manner of obstacles were placed in the way of Dr. Ledent and his colleagues. Among the diseases noted were pneumonia, meningitis, albuminuria, and typhus, but what struck him most was the frequency of more or less generalized oedema the result of cold, bad food, or punishment by exposure in the open air. Many of the men were so weak that their journey had to be broken at Lille. Phlegmon and purulent pleurisy caused many deaths. There was a large number of cases of tuberculosis, which developed rapidly. The variety of lesions of all kinds due to marasmus, especially keratitis, wasting, and premature senility, was beyond anything seen in civil practice.

Letters, Notes, and Answers.

The postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London*; telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

LETTERS, NOTES, ETC.

INCOME TAX.

War Bonus to Panel Doctors.

THE question has been raised as to whether practitioners receiving the bonus payable to insurance doctors whose professional incomes do not exceed £1,000 should include such bonuses in their income tax returns as liable to assessment. We have no hesitation in saying that legally these receipts are liable to income tax. They are given primarily as remuneration for services rendered by the practitioner, and would seem to be indistinguishable from war bonuses paid in other cases, as, for instance, to manual workers, bank officials, or civil servants. In the language of the taxing Acts, they are part of the "profits and gains" of the profession.

DIGITALIS FOLIA IN MITRAL DISEASE.

DR. RICHARD COATES (Bridgwater) writes: I wonder if any of your readers can give a scientific explanation of the fact that digitalis in the form of fol. digitalis gives better results in the case of mitral incompetence and oedema than any other form of digitalis however carefully selected and standardized. It is not only that the cardiac condition improves, oedema lessens, and flow of urine is increased as with other forms of digitalis, but the patient himself has a much greater sense of well-being and comfort. Personally I use palatinoids (Oppenheimer) ½ gr. P. fol. digitalis, one three or four times a day, with results distinctly better than when using the standardized products. The patient invariably asks for them again if I revert to the other forms of digitalis. The advantages of the fol. digitalis were first pointed out to me by Dr. Shingleton-Smith of Clifton.

THE TREATMENT OF WOUND SHOCK.

DR. RALPH W. LEFTWICH (London, S.W.) writes: While not suggesting that Professor Bayliss is in the least degree indebted to me for the idea of colloidal saline, I can claim an early application of the same principle. In the *Edinburgh Medical Journal* for 1902, and later in my *Pocket Book of Treatment*, I advocated for the treatment of constipation the addition of gelatin to the morning glass of hot water, on the theory that, by making the drink colloidal, absorption would be retarded until it could act with the best effect. A subsequent very large experience has fully confirmed this view.

SKIPPING: A WARNING.

SKIPPING has often been advocated as a means of taking exercise and improving the health; the late Dr. F. T. Bond of Gloucester was very strong on the point, and designed a special kind of skipping rope; but the exercise should be used with discrimination by elderly and short-sighted people, so as to prevent undue jarring. Mr. T. H. Bickerton, ophthalmic surgeon to the Liverpool Royal Infirmary, sends the following note, which shows the danger of this form of exercise for short-sighted people: A middle-aged man consulted me recently with this history. He had been strongly recommended to skip every evening for exercise, and did so regularly for three months. On a certain Saturday evening he skipped vigorously, and in order to give himself a thorough shaking up he purposely "let" heavily on his heels. On Sunday morning he could not see with his left eye owing to a dense haze. Examination showed complete detachment of the upper half of the retina, and one month later the eye was almost completely blind. He was short-sighted.

THE following appointments of certifying factory surgeons are vacant: Poole (Dorset), Skegness (Lincoln).

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Seven lines and under	0	6	0
Each additional line	0	0	9
Whole single column	4	0	0
Whole page	12	0	0

An average line contains six words.

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Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Wednesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers